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STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

SYMPTOMS are more numerous that the iron and steel industry is in the convalescent stage, ceasing to be on the defensive against the depression and taking an aggressive, offensive position to accelerate recovery. . . . Pittsburgh district mills, for example, after demanding reduced freight rates on finished products to Detroit, Cleveland and Toledo are urging the railroads to adjust rates to eastern ports to enable them to meet competition, especially foreign, on the Pacific coast (p. 15). Eastern mills serve notice that not without a fight will they surrender the advantage of their location. . . . Equally militant, coal, lumber and farm interests petition (p. 15) for a general reduction in freight rates on basic commodities.

Demand Steel Be Valued on Gold Basis

Even the short session of congress is being energized by the iron and steel industry into considering additional safeguards for the domestic market as recovery nears. . . . An imposing array of witnesses has favored the Hoover-sponsored depreciated currencies bills, stressing that only 48 per cent of all imports is now valued on a gold basis (p. 14). Countries still on a gold basis but buying raw materials in nongold countries would be penalized; this is directed at pig iron imports from The Netherlands. Sufficient support has been mustered in the house to force a vote Feb. 13. . . . The senate has passed resolutions (p. 14) designed to elicit information useful in drafting a bargaining tariff.

Sees Selling, Not Buying, Depressed

Attempting to fan the reviving spirits of the steel industry into full flame, a spokesman for structural fabricators is preaching the gospel of efficient selling (p. 12). New uses and markets must be "sold," he insists; renewed advertising and selling efforts are the need of the hour. . . . Structural steel awards are outstandingly high (p. 48) in a market situation temporarily, at least, gone stale. . . . Steel output last week held at 19 per cent (p. 43), a level six points higher than blast furnace activity in January (p. 13) when a slight gain was registered. . . . Financial reports for the fourth quarter continue to drip red (p. 11), but on the whole forecast improvement.

Even Strike News a "Break" for Ford

Detroit, recovering from genuine fears that its cherished open-shop position was threatened, is emboldened to discuss the Ford situation more openly. New Ford models have been delayed—the larger eight probably being shown Saturday—but the Briggs strike has

Ladies would call it scalloping, but cutting unusual shapes right on the job with the oxy-acetylene blowpipe is only everyday work for this skilled operator

advertised Ford widely (p. 16). Ford losses the past six years, or since Model T was jettisoned, exceed $122,000,000; Ford profits in 30 years have flowered from $28,000 into almost a billion . . . . Youngstown Sheet & Tube employes, incensed at the bombing of an official's residence, pledge (p. 12) their loyalty to the company.

West Coast and London Go Nationalistic

Nationalism is particularly rampant on the Pacific coast. A company aptly named All American has been organized (p. 64) at San Francisco to deal only in American iron and steel products. . . . Seattle's city council has approved (p. 62) specifications excluding French cast iron pipe from its waterfront improvement. . . . Two, however, can play this game. The British board of trade after April 1 will require (p. 14) a 50 per cent minimum content of dominion material and labor in Canadian imports, an order aimed at American manufacturers merely putting on finishing touches in Canada to qualify for empire preference. . . . British iron and steel markets, incidentally, are slightly more active (p. 62), although the Continent is quieter.

Prosecute War on Waste Vigorously

One phase of the more aggressive attitude in iron and steel is an assault upon prodigal plant practices. A study of waste flow of materials, more economical disposition of surpluses, more efficient salvage methods and education of employes are some of the objectives (p. 23) of a typical materials disposition department. . . . An extravagance some mining companies will forego is the use (p. 33) of wood cars where steel equipment lasts three times longer, hauls 20 per cent heavier loads, costs 28 per cent less in repairs. . . . Economy for the home is promised for kitchenware with a chip-proof surface (p. 26), pressed from No. 18 to 20 tin mill black sheets and specially enameled.

Engineering Progress Impervious to Depression

Sheets rolled from a composite ingot of low-carbon steel covered with a layer of corrosion-resisting alloy steel are available at a cost 40 to 50 per cent less than the solid alloy (p. 28); they are easily welded, useful in many industries. . . . A steam platen press capable of exerting 10,000 tons pressure has been found (p. 31) to deflect less than 0.004-inch under working loads. . . . A manufacturer of high-temperature alloy castings supplies X-ray radiographs (p. 31) of its castings to prove soundness. . . . Only rolled structural steel or cast steel is suitable (p. 36) for open-hearth furnace skewbacks or skew channels.

The VOICE of INDUSTRY

Communications appearing here do not necessarily reflect the opinion of STEEL *or of its editors.*

Technological Progress Is Basic to Civilization*

Technological improvements, quantity production and aids to labor have been held responsible to too large a degree for our present unemployment and general distress. The change from an agricultural country, where more than half of the population was engaged in raising the food required, to a condition where 20 per cent are so engaged, has come gradually over a period of more than 100 years. With the ups and downs of economic cycles, the shift from the farms to the cities and from the farms to industry, distributing and cultural enterprises, has been made with relatively little distress. Here and there some dramatic change in process has temporarily thrown a number of people out of employment. In most cases improvements have been more gradual, and the task of readjustment less severe. In individual cases there has been serious distress, but in general, the well-being of our people has improved steadily during the entire period of these technological advances. Since less manual labor is now required, more people can be doctors, lawyers, ministers, artists, and the cultural improvement of the last 50 years has been made possible.

Unless we are willing to say that we have achieved the greatest possible comfort and material and cultural well-being, we are on unsound ground to say that technological development has progressed too far. Perhaps part of the fault lies somewhere else. Suppose an Utopian situation in which a balance had been maintained between expenditures and earnings, so that individuals and companies had not contracted debts out of all proportion to their earning capacity, and in advance of their earnings. Perhaps if this had been true the progress toward a general distribution of material comforts, which had achieved a considerable degree of success in 1928 and 1929, would not have suffered the abrupt curtailment that has occurred since.

If our people had been thrifty and had purchased commodities only as their earnings permitted, we would not have had the boom of 1928 and 1929, and we might not have had the depth of our present depression. We would not have had an accumulation of debts that are now our principal handicap in going forward.

Industrial and business management throughout the country is conscious of the necessity in the case of individuals, companies, and the government for balancing budgets so that income will not be less than expenditures. Management is conscious of the enormous problem of unemployment, and is entirely willing to aid any plans that will help to cushion a similar situation in the future. Certainly unless we are to go back to the unhappy conditions of 50 or 100 years ago and surrender the physical well-being of our people, we cannot surrender the technological improvements that provide the many things necessary for our present scale of living.

GEORGE P. TORRENCE, President,

Link-Belt Co.

Chicago

*From a weekly letter to employes of the Link-Belt Co., Jan. 23, 1933.

U. S. Steel Reduces Loss but Pares Dividend to $2 Rate

A DEFICIT of $16,729,368 prior to declaration of a 50-cent dividend on its preferred stock is the financial experience of the United States Steel Corp. for fourth quarter.

However, the showing of the fourth quarter was better than that of the second and the third quarters and it is the first improvement since the Steel corporation went into the red in the fourth quarter of 1931.

For 1932, the total loss before any dividends but after charges was $71,271,799, which compares with a net of $13,038,141 in 1931. This net was made possible by the inclusion of $19,341,659 of special income.

Owing to the lack of a number of financial reports of independent steel producers at press time, the compilation by STEEL of losses of the steel industry per ton of ingots produced in the fourth quarter and all 1932 necessarily is postponed another issue.

For the first time in the history of the Steel corporation, dating back to 1901, the full $1.75 quarterly payment on the preferred has been reduced, the declaration for the fourth quarter being 50 cents. Steel preferred is cumulative.

In mitigation of the large deficit piled up in 1932, it is noted that the allowance for depreciation was $39,321,863. Including allowances for deterioration, exhaustion and retirement of fixed property, the year's reduction in net assets, working and fixed, was $90,186,557. The year's reduction in net working assets, including cash, government securities, receivables and inventories, was about $70,000,000, notwithstanding drastic economies. Following is a comparison of 1932 with 1931:

	1932 Deficit	1931 Income
Operating net deficit (income 1931) exclusive of depreciation allowance	$31,949,937	$60,356,036
Preferred stock dividends heretofore declared (5¼% in 1932)	18,914,757	25,219 677
Common stock dividends		38,983,949
Total draft on cash surplus	$50,864,694	$ 1,847,590
Depreciation allowances	39,321,863	47,317,895
Total reduction of surplus	$90,186,557	$49,165,485

Based on the production of steel products, Steel corporation subsidiaries were engaged 18.3 per cent of capacity in 1932, compared with 38 per cent in 1931. Operations for the second half averaged only 15.4 per cent.

In issuing the report no comment was made upon the wage situation.

The detail for the fourth quarter is as follows:

Deficit for the quarter resulting from operations after deducting all expenses incident thereto, including ordinary repairs and maintenance of plants and taxes		$ 3,828,272
Charges and allowances for depletion, depreciation and obsolescence		9,351,961
Deficit		$13,180,233
Interest charges for the quarter:		
On bonds of subsidiary companies	$1,315,905	
On United States Steel Corp. bonds outstanding	3,576	
		1,319,481
Total deficit from operations		$14,499,714
Add, proportion of overhead expenses (of which taxes alone are $1,755,997) of the Lake Superior iron ore properties and Great Lakes transportation service, normally included in the value of the season's production of ore carried in inventories, but which because of the extreme curtailment in tonnage or ore mined and shipped in 1932 is not so applied		2,331,293
		$16,831,007
Less, net balance of sundry receipts and charges, including adjustments of various accounts	(Cr.)	101,639
		$16,729,368
Dividend for the quarter on stock of United States Steel Corp.: Preferred, ½%		1,801,405
Total deficit for the quarter provided from undivided surplus		$18,530,773

National Steel Profit Is Up in Fourth Quarter

Net earnings of the National Steel Corp., after all charges, in the fourth quarter were $354,045, compared with $155,075 in the third quarter, and putting the net of the corporation for 1932 at $1,662,919, compared with $4,443,323 in 1931.

National Steel thus achieves the distinction of being the only large integrated steel producer to stay in the black in 1932. Its earnings were equivalent to 77 cents a share on the common, or 2 cents more than the dividends paid.

Cash on Dec. 31 was $6,200,000, compared with $3,755,000 as of Dec. 31, 1931. The ratio of current assets to current liabilities doubled from 4.7 to 1 at the beginning of the year to 9.4 to 1 at the close. The following is a comparison of 1932 with 1931:

	1932	1931
Operating profit after deducting selling, general and administrative expenses and federal taxes, but before allowance for depreciation and depletion, and interest charges	$6,880,848	$9,676,579
Depreciation and depletion	3,089,912	3,117,402
	3,790,935	6,559,176
Interest on funded debt	2,128,015	2,115,852
Net Profit	$1,662,919	$4,443,323
Net per share (2,156,832 shares)	.771	2.06
Times interest earned	1.871	3.100

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American Steel Foundries, Chicago, experienced a net loss of $1,526,244 in 1932, against net loss of $791,373 in 1931.

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Sivyer Steel Casting Co., Milwaukee, reports net loss of $111,114 for 1932, after charges, compared with loss of $73,963 in 1931.

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Transue & Williams Steel Forging Corp., Alliance, O., shows net loss of $142,673, after charges, in 1932, against net loss of $167,874 in 1931.

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Ferry Cap & Set Screw Co., Cleveland, encountered in 1932 a net loss of $195,994, after charges, contrasted with net loss of $182,960 in 1931.

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Dominion Foundry & Steel Ltd., Hamilton, Ont., reports, after charges, net profit of $58,084 in 1932, compared with operating profit of $400,435 in 1931.

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Warren Foundry & Pipe Corp., Wharton, N. J., sustained in 1932, after charges, a net loss of $49,786, contrasted with a net profit of $294,188 in 1931.

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Allis-Chalmers Mfg. Co., Milwaukee, reports net loss of $2,955,043 in 1932, after charges, compared with net profit of $1,256,431 in 1931. Bookings in 1932 totaled $12,316,555, compared with $22,687,048 in 1931. Unfilled orders Dec. 31 totaled $5,441,825.

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General Refractories Co., Philadelphia, proposes to refund $5,000,000 in two-year 5 per cent notes dated March 1, 1933, by issuing $6,000,000 in five-year 6 per cent first mortgage cumu-

lative income bonds with stock warrants.

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A. M. Byers Co., Pittsburgh, and subsidiary Orient Coal & Coke Co., reports net deficit after taxes, depreciation, etc., of $285,043 for the fourth quarter of 1932. Operating loss was $135,547 after deducting all expenses including taxes, but before depreciation.

Sheet & Tube Employes Deprecate Bombing

A resolution submitted to directors of Youngstown Sheet & Tube Co., Youngstown, O., Jan 30, from a committee of workers elected under the employes representation plan condemns the recent bombing of the home of A. W. Smith, general superintendent of the company.

The committee remarked upon "a fine spirit of co-operation with the representative plan," lauded the efforts of the management in the division at work and help to needy employes, and declared "it is unthinkable that any employe would commit such a despicable crime against Mr. Smith or any other official of the company."

May Merge Japanese Works

A bill combining 13 of the most important iron and steel companies in Japan, with the Government Steelworks as the pivot, was to be submitted to the Japanese imperial diet convening Jan. 20. Included in the combine are the South Manchurian railroad properties in Manchuria. For a number of years dividends would be limited to 6 per cent. The Government Steelworks is starting on a two-year program, which will include the construction of four 100 ton open-hearth furnaces.

Intensive, Aggressive Selling Vital Need of Steel Industry, Says Abbott

SELLING, not buying, stopped in 1932, declared Charles F. Abbott, executive director of the American Institute of Steel Construction, New York, in addressing the Builders' Exchange and Construction Industries committee of the Los Angeles chamber of commerce, Feb. 1. He said further:

Not only must we renew our advertising and selling efforts to regain our business but we must also go about the recovery in a scientific way. Are we going to let the sadly-learned lessons of the past three years produce our profits for years to come?

The steel industry, of which ours is an important part, is going through a great change. It is one that cannot be effected overnight because of the deep-seated heritages and the vastness of the industry's ramifications. But it is none the less obvious and proves my thesis.

Must Become Distribution Minded

It is a huge undertaking to transform the steel industry from a production attitude of mind to one wherein distribution becomes the chief incentive.

Steel cannot be produced unless it can be sold. It cannot be sold unless a demand exists or is created. Obviously production depends upon sales, therefore, the market should invite the major part of business thinking and planning.

There is a tremendous opportunity to develop new uses for all kinds of steel products. There are also possibilities to extend present markets beyond the existing normal rate of consumption. Technical research to reduce costs, improve quality and develop new applications represents a need if these ends are to be accomplished.

More efficiency in selling, with an aggressive militant approach to market possibilities would then find a way necessary for greater and more profitable results.

Make Salesmen Profit-Conscious

We hear the claim that structural steel is not sold, but that it is bought. That may be the custom, but that it should be sold is evidenced by the fact that profits are a logical conclusion of selling and they disappear whenever the buyer dictates the price.

We must develop selling on a new basis. Under this new method all compensating rewards must be based upon the amount of net profits that a salesman produces. A profit is the only excuse for any business and without profits there should be no cause for any compensation. Salesmen must become profit-conscious, and they will as soon as they become creative business builders.

Only a few years ago we were proud of our thousand-ton furnaces. We marveled at our new mills. Technological improvements were considered as a means of salvation. As important as these engineering improvements undoubtedly are, they failed to solve the marketing problem of the industry. I sometimes wonder if they did not hasten the day of accounting, the day when we were brought face to face with our marketing difficulties?

Only a few years ago the bulk of sales of this industry was a tonnage product. Today new alloyed steels are being turned out and other specialties in a vaster quantity than was ever dreamed possible. A larger percentage of the ingot capacity of the steel industry is now being consumed in these specialties.

In demonstrating technical research it has been discovered that the market and its needs are of greater importance than was credited in those dark days of the past.

Research Useless Unless Heralded

We should not forget that research, new uses and new markets will fail completely unless the public are acquainted with the product and educated to all of its advantages. Their approval must first be attained before a demand can exist. Orders never happen, they must be stimulated and obtained by conviction, and this calls for intelligent advertising, sales promotion and aggressive salesmanship.

The financing of such an undertaking should be based upon the volume of business that it is possible to obtain and appropriations made in sufficient yearly amounts that would justify a constantly increasing business.

Just as the master word of yesterday was initiative, so the word of today is co-operation, and the word of tomorrow will be intelligent co-ordination. Our immediate task is to understand co-ordination of effort and be prepared to put it into practice.

Coke Total 21,939,413 Tons

Preliminary report of the bureau of mines, Washington, gives coke production in 1932 as 21,166,913 net tons of by-product and 772,500 net tons of beehive or a total of 21,939,413 tons. Final figures for 1931 were 32,355,549 tons of by-product and 1,128,337 tons of beehive, or a total of 33,483,886 tons. In 1932 there were 44 by-product coke plants connected with blast furnaces and 42 other plants. The blast furnace coke plants last year produced 11,434,842 tons of coke, compared with 20,817,240 in 1931.

Preparing Scrap Not Selling

Georgia court of appeals has ruled against the Georgia tax board in the latter's effort to classify a scrap yard as a selling institution. The court held that "the business of sawing up scrap iron is merely preparatory to selling," and hence taxable at a lower rate.

Fuel Use Off 31 Per Cent

Consumption of the principal forms of fuel and power in the United States will probably show a decline

of 31 per cent in 1932 from 1929, according to the National Industrial Conference board, New York. Preliminary figures show that coal, which supplied 64 per cent of energy in 1929, decreased to 56 per cent in 1932. This decline of 40 per cent in the use of coal compares with 15 per cent for all other forms of energy, including fuel oil, gasoline, natural gas and water power.

Employment Up in November

Washington—Employment in 210 iron and steel plants reporting to the bureau of labor increased 0.4 per cent in November; in 40 cast iron pipe plants, 1.9 per cent; and in 148 machine tool plants, 3.1 per cent, comparisons being for identical plants for October and November. In 184 structural steelwork plants, November employment dropped 2.3 per cent.

Pipe Foundry Breaks Record

The Colorado Fuel & Iron Co. pipe foundry at Pueblo, Colo., set a new high record in December when it produced 1262 tons, made by 78 men working 8-hour shifts on one pit. December topped the 1253 tons cast in November, which in turn broke the previous high of July, 1923. The pipe cast in November and December is for Greeley, Colo.

Receivers Are Ousted

Pressed Steel Car Co.'s chancery court receivership was discharged Jan. 31 by the New Jersey court of errors and appeals. Permanent receivers had previously been named. The court asserted: "A $40,000,000 corporation may not be liquidated to satisfy a claim of a few thousand dollars when the management appears to be honest and capable."

Mining Clinic for Tungsten

Boulder County Mining Clinic has been organized in Boulder, Colo., with Dr. R. D. George, geologist of the University of Colorado, Boulder, as president and J. E. Byron as secretary, to co-operate with the Boulder County Mining association in developing the tungsten ore industry.

Home Shaving Aids Abrasives

Wisconsin Abrasive Co., Milwaukee, is operating heavily, largely on razor blade hones, increased demand being attributed to economy prompting more men to shave at home.

Byers Directors Continue

Directors of the A. M. Byers Co., Pittsburgh, were re-elected at the annual meeting Jan. 26.

January Iron Output Gains As Three Furnaces Resume

WITH a net increase of three operating blast furnaces, production of coke pig iron in the United States in January moved upward 3.9 per cent in both total and average daily rate, nevertheless the month stands as the poorest January since 1894.

The production fell considerably short of recovering the loss of December. Stacks making iron on the last day of January totaled 45, as compared with 42 on Dec. 31.

Total production of pig iron in January was 568,785 gross tons, this being an increase of 21,606 tons over the 547,179 tons of December. The output for November was 625,753 tons. In January one year ago, the figure was 971,437 tons.

Average daily production for the month was 18,348 tons, which, compared with the 17,650-ton rate of December, was a gain of 698 tons per day. The rate for November was 20,858 tons, while the low point for the year as well as for all time since 1894 was 17,035 tons in August. In January, 1932, the daily rate was 31,336 tons.

Relating production to capacity, the operating rate for January was 13.0 per cent, moving up one-half point from the 12.5 per cent rate of December. Lowest operations for 1932 were 12.0 per cent in August.

The 45 active blast furnaces on the last day of the month compares with 42 in December, 51 in November, 50 in October, 46 in September and 41 in August, the latter being the all-time low point.

During January, four furnaces resumed activity and only one went out of blast, making a net gain of three units. Three nonmerchant or steelworks stacks became active and none was blown out or banked; of the merchant class, one went in and one out.

Furnaces resuming during the month were In Ohio: Ohio No. 2, Carnegie Steel Co. In Pennsylvania: Carrie No. 7, Carnegie Steel Co.; and Shenango No. 3, Shenango Furnace Co. In Colorado; One Minnequa, Colorado Fuel & Iron Co. The only furnace going out was Pioneer No. 2 of the Republic Steel Corp.

AVERAGE DAILY PRODUCTION

	1933	1932	1931	1930
Jan.	18,348	31,336	55,337	91,573
Feb.	.....	33,122	61,114	101,640
Mar.	.....	31,194	65,448	104,930
Apr.	.....	28,524	66,986	106,371
May	.....	25,282	64,355	104,564
June	.....	20,867	54,599	97,817
July	.....	18,394	47,170	85,110
Aug.	.....	17,035	41,264	81,455
Sept.	.....	19,788	38,947	75,893
Oct.	.....	20,795	37,831	69,851
Nov.	.....	20,858	36,727	62,182
Dec.	.....	17,650	31,625	53,732
Av.	18,348	23,699	50,035	86,141

JANUARY IRON PRODUCTION

	No. in blast last day of month Jan.	Dec.	Total tonnage made Merchant	Nonmerchant
Ohio	13	12	18,429	178,215
Penna.	15	13	32,797	104,341
Alabama	2	3	11,526	12,420
Illinois	3	3	20,995	26,060
New York	1	1	.....	16,735
Colorado	1	0		
Indiana	4	4	119	87,985
Maryland	2	2		
Virginia	0	0		
Kentucky	1	1		
Mass.	0	0		
Tennessee	0	0		
Utah	1	1	.....	45,212
West Va.	1	1		
Michigan	1	1		
Minnesota	0	0		
Missouri	0	0		
Ferro and spiegel—all states	0	0	.....	13,951
	45	42	83,866	484,919

MONTHLY PIG IRON PRODUCTION

	1933	1932	1931
Jan.	568,785	971,437	1,715,443
Feb.	.....	960,550	1,711,192
March	.....	967,015	2,028,906
April	.....	855,734	2,009,582
May	.....	783,769	1,995,001
June	.....	626,015	1,637,998
July	.....	570,222	1,462,270
Aug.	.....	528,105	1,279,205
Sept.	.....	593,640	1,168,436
Oct.	.....	644,648	1,172,781
Nov.	.....	625,753	1,101,820
Dec.	.....	547,179	980,377
Total	568,785	8,674,067	18,263,011

RATE OF OPERATION

(Relation of Production to Capacity)

	1933[1]	1932[1]	1931[2]	1930[3]
January	12.6	22.1	38.4	65.0
February	.....	23.4	42.5	72.1
March	.....	22.0	45.4	74.5
April	.....	20.2	46.5	75.4
May	.....	17.9	44.7	74.2
June	.....	14.7	37.9	69.3
July	.....	13.0	32.7	60.3
August	.....	12.0	28.7	57.8
September	.....	14.0	27.0	53.8
October	.....	14.7	26.3	49.6
November	.....	14.7	25.5	44.1
December	.....	12.5	22.0	38.1

[1]Based on capacity of 51,598,175 gross tons Dec. 31, 1931; [2]on capacity of 52,515,875 tons; [3]on capacity of 51,490,680 tons. Capacities by American Iron and Steel institute.

Steel Leaders Back Currency Bills; News of Washington

THE house will vote Feb. 13 on a motion to discharge the ways and means committee from further consideration of the depreciated currency bills, 145 members having signed a petition for a vote.

While hearings on these bills have been held by a subcommittee of the ways and means committee, it was expected that the bill would be pigeon-holed pending a disclosure of the Roosevelt program at the forthcoming special session of congress. After a vote has been taken to take the bills from the committee a vote may be taken on their passage, but favorable action is not expected.

Thomas J. Doherty, tariff counsel of the American Iron and Steel institute, in speaking at a hearing on these bills said:

"It is now absolutely essential to the safety of the revenue and the protection of American labor and industry that we should abolish the practice of appraising imports on their valuation in foreign countries and substitute therefore some form of domestic value.

"The total failure of the present methods of appraisement is demonstrated by the damage, amounting to ruin in some cases, to thousands of establishments engaged in domestic industry, immediately caused by the depreciation in the currencies of several foreign countries that are large exporters to us.

Decline 25-60 Per Cent

"Those currencies have depreciated, compared with their value when the tariff law was enacted in 1930, from 25 to 60 per cent, which means that the foreign goods are being appraised at from 40 per cent to 75 per cent of the value that was in contemplation of the law when it was passed.

"This means a terrific loss of revenue to the government and is absolute repeal of the tariff law so far as it assumes to protect American labor and industry."

T. W. Kennedy, president of the Mystic Iron Works, Everett, Mass., has given the subcommittee prices of imported iron which were lower than the domestic cost. He suggests that the Netherlands, although on gold basis, should not be exempted from the compensatory duties, since that country gets its materials for iron manufactured from Spain, South Africa and other countries having heavily depreciated currencies. Entry of goods from countries having debased currencies, he said, is equivalent in effect to unrestricted immigration.

Mr. Kennedy said that he was not enthusiastic about the Hawley bill to place tariff readjustment authority in the tariff commission, and he disapproved the delay of 60 days in putting the revised rates into effect. He favored the Hill bill, which deals in another way with depreciated currency.

James A. Farrell, retired president of the United States Steel Corp., who has appeared in favor of the depreciated currency bills, maintains that 52 per cent of products now being imported into the United States come from countries having depreciated currencies.

He lays down six principles to guide the committee, including an exemption of countries where the depreciation is 5 per cent or less, safeguards to prevent shipping of depreciated currency products through third countries, and the application of existing ad valorem duties to the depreciated values plus the compensating depreciated currency charge.

Tariff Information Sought

The senate has passed two resolutions, introduced by Senator Costigan, calling upon the tariff commission for information referred to in last week's issue of STEEL. The resolution would give information to the senate which would be helpful in tariff bargaining.

Senator Reed of Pennsylvania, did not make any speech on the subject but he stated that "I should like the record to show that I am opposed to the passage of both of these resolutions."

One of the reports asked from the commission is of relative imports of certain commodities for designated years, and for certain other information concerning imports and exports.

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Reconstruction Finance Corp. has approved the following projects:

Los Angeles, Calif., $22,800,000 loan approved for water and power project requiring 28,000 tons of structural steel and 1090 tons of copper steel ground wire.

Brookneal, Va., $27,000 for water supply system, of which $19,000 is for cast iron pipe.

Melba, Idaho, $60,000 for irrigation projects requiring 5564 feet of 36-inch and 1182 feet of 24-inch steel pipe.

Dufur, Oreg., $10,000 for a water supply line.

Glen Rose, Tex., $45,000 bonds for completing waterworks and sanitary sewer system, to take 1700 feet of 8-inch cast iron pipe, 1900 feet of 6-inch cast pipe, 650 feet of 4-inch cast pipe and 14,000 feet of 2-inch galvanized pipe.

Vernal City, Utah, $38,000 bonds for improving water system, including laying of 11,000 feet of 12-inch cast iron pipe and 5700 feet of 4-inch pipe.

Long Pine, Nebr., $15,000 bonds for laying 4800 feet of 8-inch cast iron pipe.

Cambridge, O., $25,000 bonds for 400 tons of 24-inch cast pipe for a sanitary sewer.

New Orleans, $1,300,000 bonds of Orleans levee district for flood protection.

Greenville, Miss., $175,000 bonds for a river freight terminal.

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An order issued by the British board of trade, Jan. 30, requires a minimum of 50 per cent of empire material and labor, instead of 25 per cent as at present, for manufactures of Canada to be admitted into Great Britain as "empire goods." This is to prevent American manufacturers shipping their products to Canada, putting finishing touches on them in the dominion and shipping them to Great Britain under preference regulations agreed upon at Ottawa in 1932. This order is effective April 1.

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Representatives of metal and ornamental iron interests of New York, representing subcontractors, have testified on the Goss bill, designed to correct unethical practices in bidding on federal construction projects. Changes proposed in the bill would correct the evils of "chiseling" within 30 days, it was claimed.

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A favorable report has been made by the house committee on labor on the bill which would prevent interstate commerce in commodities manufactured by those employed more than five days a week. Hearings on a similar bill are being held in the senate.

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Drawback has been allowed by the treasury department on flanges for steel drums manufactured by the American Flange & Mfg. Co., Chicago, with the use of imported band steel.

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Reconstruction Finance Corp. in a supplementary report states that since its organization it has made 104 loans aggregating $337,435,093 to 62 railroads, of which nearly $48,000,000 was for the completion of new construction.

Pittsburgh for Lower Freight Rates To Aid Coast Trade

QUICK relief was the keynote of a public hearing at Pittsburgh, Feb. 1, at which steel mills in the Pittsburgh district proposed lower rail rates to the Atlantic seaboard when steel is to be shipped via water to the Pacific coast.

The Pittsburgh mills are asking that export-rail rates on carload lots of steel be applied to the products they are shipping from Pittsburgh to Baltimore, New York and Philadelphia for transhipment through the Panama canal to California, Oregon and Washington.

For steel made in the Pittsburgh district destined for export, Pittsburgh mills pay 17½ cents for 100 pounds to ship from Pittsburgh to Baltimore, 18½ cents for Pittsburgh to Philadelphia and 20½ cents for Pittsburgh to New York, whereas Pittsburgh mills pay 27 cents, 29 cents and 33 cents to Baltimore Philadelphia and New York, respectively, today when they wish to ship to the Pacific coast.

Enumerates Disadvantages

Interesting data were contained in exhibits offered by A. R. Kennedy, traffic manager, Pittsburgh Steel Co., before the Central Freight, Trunk Line and New England freight associations. Exhibits showed rate data and brought out clearly the disadvantage at which Pittsburgh is working, mainly in competition on the Pacific coast with Birmingham, Ala., steel mills which ship by rail at a proportionately lower rate to New Orleans and Mobile, Ala., for transhipment by water to the Pacific coast.

For example, both Mobile and New Orleans have the same ocean freight rate into the Pacific coast markets as Baltimore, Philadelphia or New York. Yet, the Birmingham-New Orleans rail haul is lower than the Pittsburgh-Philadelphia rail haul, although approximately the same mileage.

Steel interests represented at the meeting brought out further that aside from losing their Pacific coast markets to Birmingham, Ala., competition, they are suffering greatly from the inroads of foreign steel.

As was cited in the particular market on wire nails, the foreign mills have been setting the West coast market and domestic mills, even Birmingham, have been forced to absorb considerable loss.

To further drive home the necessity that American railroads should afford the steel mills relief, John A. Coakley, vice president, United States Steel Corp., pointed out that foreign producers of steel had been given rate reductions by railroads in their own countries when they employed rail transportation for subsequent export of steel products to such markets abroad as the United States.

Obviously these foreign rail rate reductions have aided the foreign steel seller favorably in being able to sell on the Pacific coast. Mr. Coakley pointed out that their shipments of steel alone in the year 1931 to the Pacific coast markets were approximately 86,000 tons and that even in 1932, with the twelfth month estimated, they would not be much less.

Interested parties from the Buffalo district presented their views; among them were the Wickwire Spencer Steel Co. and the Buffalo Bolt Co. These interests further stressed the fact that foreign competition and rail-export advantages enjoyed by Birmingham steel mills had seriously impaired their Pacific coast outlets.

Opposition to this reduction was voiced by the Alan Wood Steel Co., Conshohocken, Pa., Lukens Steel Co., Coatesville, Pa., John A. Roebling's Sons Co., Trenton, N. J., and the South Chester Tube Co., Chester, Pa.

Bethlehem Faces Dilemma

The position of the Bethlehem Steel Co. was not indicated, although it is unique in that the Sparrows Point, Md., plant can export to the Pacific coast for about a 35-cent ocean rate and at the same time the Pacific Coast Steel Corp. at Los Angeles is a subsidiary of Bethlehem.

The possibility of all-water shipment of steel from Pittsburgh to the Pacific coast also came up for discussion. This would mean all-barge delivery to New Orleans followed by ocean delivery through the Panama canal to the West coast. While this mode of transportation has not yet been attempted, it has been seriously considered. Service disadvantages appear great, however, as shipments of this nature would require four to five weeks.

In part a solution, it was divulged that the American Rolling Mill Co. has been employing a 59-cent rail-barge-ocean rate from Middletown to the Pacific coast by way of Cincinnati, the Mississippi river, New Orleans and the Panama canal. This rate is recent, having been made only within the last several months.

Jones & Laughlin Steel Corp., Carnegie Steel Co., Pittsburgh Steel Co. and other Pittsburgh, Valley and Cleveland producers went on record as favoring the petitioned reduction for the Pittsburgh mills' rail rate to Baltimore, Philadelphia and New York.

Inasmuch as there is little chance of the interstate commerce commission acting to grant an all-rail reduction overland from Pittsburgh to the Pacific coast, the petition at present confines itself to seeking immediate relief solely on shipments to the three Atlantic seaboard points.

Following closely on a fight by Pittsburgh steel mills to get a lower freight rate into Detroit, this meeting of Feb. 1 shows obviously the serious handicap under which the steel mills are placed by freight rates, which are no longer in keeping with competitive situations and lower steel prices. But the possibility of sectional rate reductions appears remote. In all likelihood, little of a definite nature can be expected until a horizontal rate reduction on all products is petitioned.

Urge General Rate Cut

American Farm Bureau Federation, the Farmers' Education and Co-operative Union of America, the National Grange, the National Coal association and the National Lumber Manufacturers' association have filed a joint petition to the interstate commerce commission proposing an immediate and general reduction of freight rates on basic commodities.

Burner Groups Federate

The distillate oil burner industry and the power oil burner industry have effected a closer relationship through placing the Distillate Burner Manufacturers' association in the office of the American Oil Burner association, 342 Madison avenue, New York, of which Harry F. Tapp is executive secretary.

Market Data Book Is Out

Basic market data especially designed to aid sellers of products consumed in the manufacturing industries to locate their markets more accurately and economically and to estimate public demand are given in the department of commerce newest trade publication "Manufacturing Market Statistics." This is available for $1 from the government printing office, Washington.

This Is Induced Obsolescence

A 30-ton bridge near Ashland, Nebr., disappeared Jan. 26, thieves dismantling the steel and hauling it away with a truck.

MIRRORS OF MOTORDOM

DETROIT

THE St. George of Dearborn has been slaying dragons again. On the front pages of thousands of newspapers he has repulsed "the bankers" and those competitors—presumably General Motors and Chrysler—whom he charges would "prevent another Ford car from leaving the factory."

Bankers always have been anathema to Mr. Ford, and in the rural districts where the name Ford is regarded almost reverentially it is especially popular at this time to harry them.

Quite casually, of course, but none the less effectively, the newspapers in their accounts of the strike at the Briggs Mfg. Co. have referred to the forthcoming introduction of new Ford models.

So Detroit, still a little puzzled over the "breaking" of the story of a local strike by a newspaper in distant London following a wireless telephone interview with Mr. Ford, is muttering that Henry has done it again; he has obtained for nothing publicity for which his competitors must pay hundreds of thousands of dollars. This is more of the same free publicity.

Detroit also is grieved that in these times, when the going is hard for the entire automobile industry, so important a personage should accuse his competitors of fomenting strikes; also, that he should indulge in such heroics when the cherished open shop of the automobile industry was in the gravest danger in its history.

But the Briggs strike and the consequent holdup of the Ford program have brought out into the open a discussion of the Ford situation over which Detroit is increasingly apprehensive, but which in some respects is more favorable to Mr. Ford than may be deduced from surface indications.

Recounting automobile history of the past few years, it is inescapable that domination of the low-price field has passed from Mr. Ford, that his dealer relationships are disquieting, and that his financial losses have been huge.

At the same time, no other large corporation went into the depression with so adequate a treasury, and the resourcefulness of Mr. Ford is such that he is most dangerous to his competitors when apparently with his back to the wall.

Unquestionably the year 1927, in which the reign of Model T came to an end, was the crucial one in Ford history, barring of course present events. From 1908 to 1927, or during the lifetime of grinding Model T, Ford assembled approximately 16,000,000 units or 49 per cent of the 32,998,548 motor vehicles produced in that period.

From 1927 to 1932 inclusive, Ford accounted for only 4,092,259 units, or 19 per cent of the total of 21,156,501. Here is eclipse indeed.

Impaled on Integration

For it, Detroit lists a number of reasons, some beyond the control of Mr. Ford: The tendency of the retail market for automobiles to become stabilized; the high cost of integration which other manufacturers avoided; the rise of the closed body and wide options in color and finish; and the passing of the last word in automobile buying from men to women.

Not least, it was inevitable that the Ford success in volume production in the low-price field should attract the competition which has challenged it. From 1927 to 1932 inclusive Chevrolet made 3,850,000 units, almost as many as Ford.

So far as finances are concerned, it is probable that the Ford enterprises, like thousands of other corporations, are feeling the pinch of the times. Not until May, when the Ford Motor Co. makes its annual report to the Massachusetts commissioner of corporations and taxation, will the 1932 showing be known.

However, it is believed in Detroit that the Ford losses in 1932 approximated $80,000,000, or more than $1,500,000 a week. This estimate is largely arrived at by relating the shrinkage of $53,586,000 in the profit and loss account in 1931 to the realities of 1932. In only two of the six years since Model T was dropped has Ford made money, and in these six years his net loss has been $122,335,541.

All Ford financial statistics are approximations, of course. Since 1919 there have been only three stockholders—Mr. and Mrs. Henry Ford and their son Edsel. What has been taken out in dividends is not disclosed.

There can be only generalizations from the annual statement to the Massachusetts bureau, and on this basis the following appears to be the financial history of the Ford company since 1909, the first full year of production of Model T:

Year	Profits
1909	$ 3,125,876
1910	4,127,208
1911	7,288,303
1912	13,552,239
1913	27,001,203
1914	24,923,449
1915*	23,426,662
1916	57,056,429
1917	26,715,944
1918	30,341,057
1919**	70,000,000
1920†	61,907,449
1921†	17,198,564
1922††	57,601,040
1923 (a)	119,298,862
1923*	82,263,483
1924	115,105,416
1925	115,078,383
1926	75,270,895
1927 (deficit)	42,786,727
1928 (deficit)	72,221,498
1929	81,797,861
1930	44,460,823
1931 (deficit)	53,586,000
1932 (est. deficit)	80,000,000

*10 months. **Year ended July 31. †10 months ended April 30. ††10 months ended Feb. 28. (a) Year ended Feb. 28.

From this it may deduced that

the net profit of Ford, always qualified by the lack of knowledge concerning withdrawals for dividends, from 1909 to 1932 inclusive, has been $808,946,921.

This extraordinary record, surpassing anything in the history of the United States, is the pyramiding of $28,000, which was the actual cash raised toward the stated capital of $100,000 when the Ford company was incorporated in 1903. All profits, dividends, plants have originated in this $28,000; no other money ever was put into the company.

As previously related, the cash showing of the Ford Motor Co. at the beginning of 1933 will not be available for several months, but as of Dec. 31, 1931, the liquid assets of Ford totaled $372,483,105. Other assets included real estate at $158,387,688, machinery and equipment at $124,601,735, inventory at $64,884,691 and deferred charges at $1,972,496, or a grand total of $722,329,715.

Historically, this year of distress marks the thirtieth anniversary of the beginning of the Ford enterprise. Model A, first of the famous family, a 2-cylinder vehicle, was born in 1903 and continued into 1904, total production being 1780.

In 1904 came Model B, a 4-cylinder job, and also another 2-cylinder car known as Model C. Model B was produced three years and C two years, combined output being 1695. Another 2-cylinder series, Model F, was in production through 1904 and 1905, having a total of 1599.

What was considered the sensation of those early days was Model N, with a 4-cylinder motor, introduced in 1906 and priced at $500. Series K, R, and S, the former being a 6-cylinder planetary-gear model, were in production in 1906, 1907 and 1908, their combined total reaching 23,616.

Model T, cornerstone of the Ford fortune, emerged in 1908 and when it was withdrawn in May, 1927, almost 16,000,000 had been assembled.

From May to early December, 1927, the Ford factories were practically closed. Model A was announced in the closing days of 1927 and by the middle of 1931, when its run was concluded, approximately 3,750,000 had been built.

Again the Ford plants were practically idle, until March 31, 1932, when the V-8 and the 4-cylinder Model B were introduced. The run on these two models to the end of 1932 was approximately 260,000 units.

Ford production reached a double high in 1924 and 1929 when in each year practically 2,000,000 units were assembled. The single day's record, in 1929, was slightly more than 9300 units. The most prosperous year for the Ford treasury was 1922, when 1,350,000 cars were assembled.

It is noteworthy that the business of the Ford company expanded fivefold in volume and fourfold in profits in the first five years, that in the first five years of Model T output increased 1800 per cent and profits 900 per cent, and that the peak of profits was reached in 1922, five years before Model T vanished.

Only in the intimate records of the Ford company can the dealer situation at this time be accurately ascertained but it is widely believed that the distress of Ford dealers is greater than that of representatives of other manufacturers, which is bad enough. The probable fact is that a surprising number of banks, indirectly, are selling Fords through their enforced carrying of dealers.

Ford has lost many dealers to competitors; many of his outlets are fairly well loaded with stocks of the V-eight and the four now being replaced; a number still smart under their forced absorption of quotas, including even Lincolns and tractors at one time; it has been galling to see Chevrolet and Plymouth dealers hanging up new registration records, for the depression; the Caesarian birth of new Fords is leaving a birthmark on the financial showing of many dealers.

Ford Innovations Are Many

Detroit, on the other hand, is not unmindful that Mr. Ford has been in the vanguard of engineering progress. While the basic idea of the assembly line originated in the packing industry, it was at Highland Park that it was first adapted to the production of automobiles. Mr. Ford has been a leading figure in the adoption of alloy steels, and had he not fought the Selden case the automobile industry might have been deeply involved in patents.

In labor matters Mr. Ford has always been a controversial figure himself. In 1929, just after the depression broke, he announced an increase in his daily minimum from $6 to $7, but he since has made two reductions, his rates now being 50 cents an hour for unskilled labor, 62½ cents for semiskilled and 75 cents for skilled. In October, 1930, he forecast a daily minimum wage of $27 by 1950.

Insofar as Mr. Ford during the strike episode has referred to feeling among his competitors, he is on solid ground. The spurt that Chevrolet made in the summer of 1927, taking advantage of the hiatus between Models T and A, is something best not mentioned at Fordson.

Nor will General Motors soon forget that after it had spent more than $1,000,000 and widely advertised its big display week for all lines beginning Saturday, April 2, 1932, Mr. Ford stole the spotlight and introduced his new eight and four on Thursday, March 31.

And recently, Plymouth officials became exceedingly sensitive when a Chevrolet dealer publication, not connected with General Motors, commented humorously upon the alleged manner in which the new Plymouth six was a followup of the Chevrolet six.

Concerning the immediate situation at Detroit, the matter of wages faded when Briggs published a new scale with a minimum hourly wage rate of 25 cents and the elimination of the dead-time deduction which cut so heavily into the day's wages.

The issue was narrowed to the demand of the strikers' organization for shop committees, which would mean the virtual unionization of the Briggs company. Other manufacturers may have had mental reservations on the low wages which precipitated the strike, but on unionization every automotive interest found common ground. A finish fight on this issue is certain.

But by the end of last week production had been resumed sufficiently at Briggs to indicate resumption of assemblies by Ford Monday, Feb. 6. This would make the formal introduction of the larger new eight about Saturday, Feb. 11, at private shows, along the lines of those when the first eight was brought out.

Mr. Ford has been at some pains to go on record as urging quick settlement of the Briggs strike, presumably with an adjustment of wages. Ford buyers generally being wage earners, it is an evil phase of the wide publicity to be associated with a low-wage controversy. But Detroit knows that the pressure at Fordson for lower prices on what it purchases has been insistent.

As has been stated previously, the new larger eight is radically streamlined. Its snowplow front indicates a close relationship to the new Lincolns. The headlights are bullet shape, with the deepest draw yet on any Ford headlight shell. An aluminum cylinder head, greatly increasing the compression, will at least be optional, if not standard, equipment. Speeds up to 105 miles per hour are reported possible with this aluminum head.

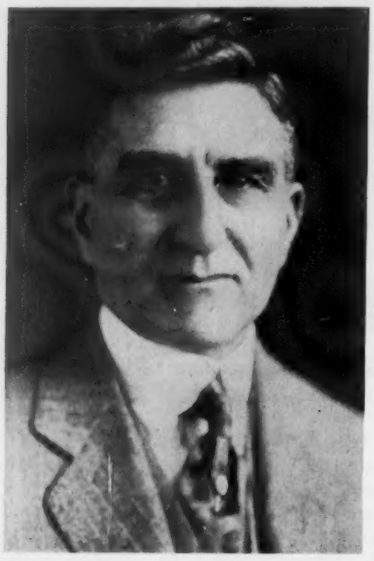
The instrument board of the larger Ford eight discloses a cluster arrangement of instrument dials, centered directly in front of the driver. Engine specifications and displacement vary little from the V eight now being displaced, but acceleration has been stepped up to a noteworthy degree in the new 112-inch model.

More radical, mechanically, will be the small 105-inch Ford, expected to sell for about $350, Detroit, probably also a V eight, to be introduced within 60 days. At this distance the opportunity for mechanical changes is so great as to make even speculation a hazard, but it is possible that

(*Please turn to Page* 65)

Industrial Men in the Day's News

Frank F. Marquard, General Superintendent, Clairton Works, Carnegie Steel Co.



WHILE his experience in iron and steel has been broad, he has principally come up through the by-product coke department.

DISCOVERIES include a rephosphorizing agent for use in making sheet bars, and a phenol disposal method for ammonia still waste.

A NUMBER of papers on coking practice are from his pen. He is a native of Cleveland, and a graduate of Case School of Applied Science.

FRANK F. MARQUARD, who has been appointed general superintendent in charge of operations at the Clairton steelworks and also the Clairton by-product coke plant of the Carnegie Steel Co., Pittsburgh, is a pioneer in the development of numerous processes in the art of by-product coke recoveries.

Mr. Marquard was born in Cleveland in 1875 and received his grade and high school education at Dayton, O. After leaving the Miami Military academy, Miami, O., in 1892, he was graduated in civil engineering at Ohio State university four years later. In 1898 he received a degree in mining engineering and chemistry at Case School of Applied Science, Cleveland.

That same year his first business position was as chief chemist with the American Steel Casting Co., Sharon, Pa., followed by a post as chemist with the National Steel Co., Sharon, Pa., in 1899. A year later, Mr. Marquard was appointed superintendent of the Buhl by-product coke plant at Sharon, and for a three-year period after 1900 he was chief chemist and metallurgist for the Sharon Steel Co., Farrell, Pa.

From 1904 to 1915 he was superintendent of the by-product coke plant at Farrell during the construction and later operation of that plant, and from 1915 to 1926 he was superintendent of the by-product coke plant at Clairton, Pa. From 1926 to date he has been assistant general superintendent of the Clairton works.

Mr. Marquard has taken out numerous patents on improved processes, and in 1902 discovered the use of ferrophosphorus as a rephosphorizing agent for basic open-hearth steel to be used in the manufacture of sheet bars. In 1908 he discovered a phenol disposal method for ammonia still waste which is now used by practically all coke plants. He also put into practice the manufacture of metallurgical coke from 100 per cent high volatile Pittsburgh coals and built the first benzol plant for the United States Steel Corp. for producing pure toluol.

He is a resident of Clairton, Pa., and in 1922 was elected first controller for the city of Clairton. He holds numerous patents on improved processes in by-product coke practice.

Mr. Marquard has had, aside from his recognized ability as a chemist, a broad practical experience in its application to the steel industry. He is the author of a number of papers on the effect of coals in the production of high quality metallurgical coke.

F. J. KING, chief engineer, Linde Air Products Co., subsidiary of Union Carbide & Carbon Corp., New York, was elected president of the Compressed Gas Manufacturers' association at the recent annual meeting in New York. This is in recognition of Mr. King's contributions to technical progress in the compressed gas industry. Shortly after graduation from the Massachusetts Institute of Technology in 1909, Mr. King became affiliated with the Linde company as junior engineer, and has been identified with the manufacture and application of oxygen and acetylene, especially in the oxyacetylene welding and cutting processes.

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Howard Coonley, president, the Walworth Co., New York, and representative of the American Society of Mechanical Engineers and the mechanical industries on the American Standards association, New York, has been elected president of the association for 1933.

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C. S. Wagner has been elected vice-president in charge of sales and a directtor of the Koehring Co., Milwaukee, manufacturing concrete mixers, paving outfits, power shovels etc.

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Edward P. Connell, comptroller of the Falk Corp., Milwaukee has been elected a vice-president, continuing his present duties. He joined the Falk Corp. in 1913.

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J. E. Montgomery, formerly assistant to the president of the Wheeling Steel Corp. and vice president in charge of operations, and since last August associated with the Otis Steel Co., Cleveland, has been made vice president in charge of operations of

the Otis company. He succeeds R. H. Clarke, who has taken an indefinite leave of absence for relaxation and travel.

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Dr. J. Mitchell Fain, consulting chemist, is now associated with Foster D. Snell Inc., 130 Clinton street, Brooklyn, N. Y.

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L. Arthur Dawson, formerly connected with the E. J. Woodison Co., now is associated with the Dawson-MacDonald Co., 178 Purchase street, Boston, which specializes in foundry equipment and abrasives.

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R. K. French, formerly in charge of shops in Sing Sing prison, has been appointed manager of the metalworking shops which will be opened shortly in the new state prison at Attica, N. Y., a Buffalo suburb.

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Herb Coats is now Pacific coast representative for the Stanley Electric Tool Co., New Britain, Conn., with headquarters at 576 Monadnock building, San Francisco. He was formerly associated with Black & Decker and Van Dorn companies.

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Harry A. Schultz has been appointed to succeed the late Charles L. Close as manager of the bureau of safety, sanitation and welfare of the United States Steel Corp., New York. John H. Osmers, of the chairman's office, will be assistant manager, succeeding Mr. Schultz.

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Mark A. Beeman has resigned as secretary of the Concrete Reinforcing Steel institute, Chicago, to become manager of the Washington office of the Portland Cement association. R. W. Johnson has assumed Mr. Beeman's former duties for the remainder of the institute's fiscal year.

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L. M. Johnston, Pittsburgh, was re-elected president of the Keystone Driller Co., Beaver Falls, Pa., recently when the board of directors met for reorganization following the annual stockholders' meeting.

E. C. Rebeske, Beaver Falls, Pa., was re-elected vice president, and Charles T. Smith treasurer.

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W. J. Ross, Hyman-Michaels Co., has been re-elected president of the Chicago chapter of the Institute of Scrap Iron and Steel Inc. Other officers include: Vice president, Walter Bregman, Price Iron & Steel Co.; secretary, Henry Rosenthal, Briggs & Turivas; treasurer, A. L. Jeffrey.

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Fred Mayer, of the law firm of Manchester, Ford, Bennett & Powers, Youngstown, O., has been elected treasurer of the Continental Supply Co., subsidiary of the Youngstown Sheet & Tube Co., at St. Louis. William J. Morris, formerly vice president and treasurer of Sheet & Tube, is president of the Continental company.

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James Reed, former commander in the construction corps of the navy, has been appointed general manager of the Golden Gate bridge, San Francisco, succeeding Alan MacDonald, resigned. Commander Reed, who is superintendent of the Schlage Lock Co., San Francisco, is 52 and a graduate of Massachusetts Institute of Technology.

Obituaries

WR. WEBSTER, 78, noted metallurgist and a charter member of American Society for Testing Materials, died Jan. 16 in Philadelphia. One of his outstanding accomplishments was the preparation of tables and the setting up of formulas from which the physical properties of steel could be reliably predicted, knowing its chemical composition. For this he received in 1897 the Scott medal of the Franklin institute. Mr. Webster also took a leading part in the work that eventually led to the grading and sale of pig iron by its chemical composition instead of by fracture, invented a machine to head eyebars in one operation, and in other ways contributed to progress in the steel industry. He was first chairman of committee A-1 on steel and in 1927 was made an honorary member of the testing society.

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V. C. Turner, 62, vice president and treasurer of the Scullin Steel Co., St. Louis, died Jan. 29 in that city.

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Ernest M. Lancaster, 62, retired treasurer of the Solvay Process Co. and its subsidiaries, Syracuse, N. Y., died at Syracuse, Jan. 28.

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H. G. Sommerfield, widely-known British foundryman and secretary of the London branch of the Institute of British Foundrymen, died Feb. 2.

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James G. Kelly, 64, president of the Kelly Foundry Co., Pittsburgh, died at Pittsburgh, Jan. 27. He had been in the foundry business on the South Side, Pittsburgh, for more than 50 years.

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Albert C. Murphy, 56, associated with the Standard Railway Equipment Supply Co., Chicago, and brother of Walter P. Murphy, chairman of the board of the Standard company, died Jan. 21 in Los Angeles.

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Neil McMillan, 80, secretary of the Detroit Metal Specialty Co., Detroit, and previously connected with the Detroit Sheet Metal Works, Art Stove Co. and National Can Co., died Jan. 20.

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John G. Parke, chief engineer of the Monessen & Southwestern railroad, plant railway for the Pittsburgh Steel Co., Pittsburgh, and formerly chief engineer of the entire works of the Pittsburgh Steel Co., died at Donora, Pa., recently. He had been in ill health for some time.

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Norman L. Snow, 52, president of the Diamond Power Specialty Corp., New York, died Jan. 27. He was formerly vice president and general manager of the Terry Steam Turbine Co., Hartford, Conn. and had also been connected with the Sirocco Engineering Co. and the American Blower Co.

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Leo. M. Dunn, 59, vice president of the Graybar Electric Co., New York, died at Garden City, Long Island, N. Y., Jan. 20. Among his first business associations was with the Western Electric Co. at Pittsburgh. He later moved to the East and upon organization of the Graybar Electric Co. in 1926 became vice president.

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Karl F. Snow, one of the founders of C. O. Bartlett & Snow Co., Cleveland, died at Cleveland, Jan. 30. Having a natural bent for mechanics, Mr. Snow early was taken in as a partner by C. O. Bartlett, then a brick manufacturer in Cleveland. Mr. Snow held a number of patents, mostly involving processes and equipment for conveying.

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Gordon C. King, son of Willis L. King, vice president of the Jones & Laughlin Steel Corp., Pittsburgh, was killed Jan. 27 in an automobile accident near Tucson, Ariz. The younger Mr. King had been on leave of absence from his position in the sales department of Jones & Laughlin and had been in Arizona several months for his health.

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D. E. Parsons, 50, New York district manager of the Railway & Industrial Engineering Co., Greensburg, Pa., for the past eight years, died at Milburn, N. J., Jan. 28. He had been with Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., from 1903 to 1916 and later was identified ith several utility companies at East St. Louis, Ill.

EDITORIAL

Industry Should Not Carry Wage-Cutting Too Far

We'll Strike if they do!

DISPUTES between employers and employes over wages that have arisen on several occasions during the past few weeks emphasize the fact that the dividing line between legitimate wage cutting and unwarranted exploitation of distressed workers has been worn pretty thin.

In at least two instances employers in the metal-working field have offered work to ordinary laborers at 10 cents per hour. In several other cases, wages of 15 and 18 cents per hour for skilled workers were offered. In every instance of which we have reliable information, the payment of such wages continued only a short time; they were abandoned or revised because of strikes or because the protest of public opinion became so strong that the employers did not dare to hold to their wage schedule.

Before serving a blanket indictment against employers who cut wages to such pitifully low levels, it is well to consider the various motives that are involved. For the most part management throughout this depression has shown more consideration for the interests of industrial workers than in any previous period of hard times. As conditions became more acute, employers were forced more and more to think in terms of preserving their businesses. Many companies finally arrived at a point where it was necessary to adopt extraordinary measures in order to survive. Among the smaller establishments, the owners were able to call in their employes and to explain to them that the business could continue only if everyone would agree to make sacrifices. Stockholders would have no dividends, officers and other salaried employers would take sharp reductions in their income, and wage workers would take unprecedented cuts in the hourly rate.

Informal Agreements Enable Small Companies To Cut Wages to a "Get-by" Basis

In many smaller, older and closely-knit organizations this plan was acceptable to all concerned, probably on the reasoning that under present conditions half a loaf, or even a few crumbs, is better than no loaf at all. At any rate, hundreds of smaller companies now are operating on this kind of a co-operative, "get by" basis, with unbelievably low salaries and wages.

This plan will work if the employes have been treated well in the past and if they have faith that their employers will compensate for the present sacrifices sometime in future when business is better. But if suspicion as to motives is aroused, or if the company commits any act which savors of exploitation of the defenseless position of the workers, then a protest goes up which results in a strike or in the fanning of community indignation to a flame which causes management to reconsider its action.

Payment of dangerously low wages—regardless of motive—has two important effects which should be watched closely by industry. The first concerns the community life of the industrial district involved. When wages drop to as low as 10 cents an hour for common labor and 15 or 18 cents for skilled work, the recipient of such wages immediately is encouraged to ask himself whether he should work or whether he should loaf. In many communities he can obtain nearly as much from local charities without working as he could earn at the low rates mentioned.

Reduction of Wages Below Prevailing Rate Precipitates New Circle of Price Cutting

The second important effect has to do with competition in industry. When a small company succeeds in persuading its employes to take wages far below those prevailing in its branch of industry, it immediately goes out and solicits business at prices considerably under prevailing quotations. The larger companies —unable to handle their wage problems in the informal way employed by smaller companies— find it difficult to retaliate immediately. But if enough business is taken away from them they are forced to take action, which, in many cases, is a cut in wages of their employes. Thus a vicious circle of wage cutting is started, which eventually imperils the entire industry.

In view of the disastrous results of extremely drastic wage cutting, not only in the evasion of social responsibility but also in the launching of unwarranted competition, every manufacturer should think twice before cutting his wage schedules below the average for his industry, unless he happens to be in one of the several fields where wages are manifestly too high. Reductions below the prevailing rate in industries that already have deflated wages to the limit, henceforth will be viewed with deserved suspicion.

THE BUSINESS TREND

Steel Deficits May Be Less in This Quarter

APPEARANCE of the annual earnings statements of industrial companies has diverted attention from the trend of current operations to speculation as to the trend of profit and loss.

In 1930 about two-thirds of the iron and steel producing companies managed to remain in black ink. In 1931 the situation was reversed, about two-thirds of the companies showing deficits in that year. However the two largest units, United States Steel Corp. and Bethlehem Steel Co., still were on the profit side in 1931.

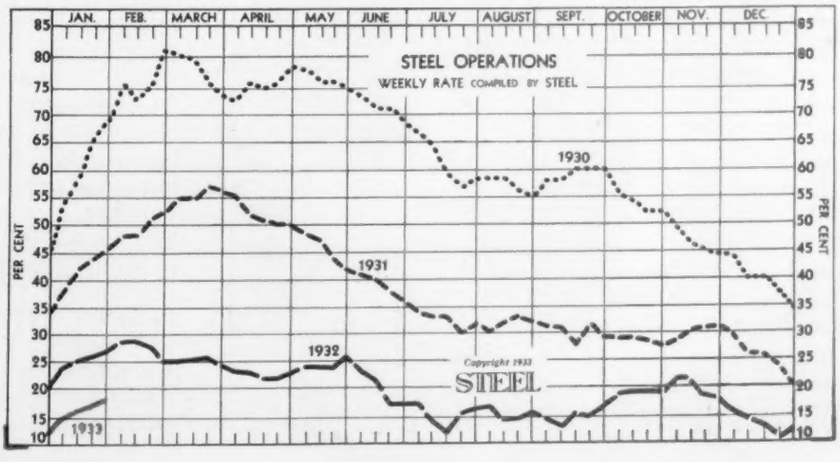
Reports for 1932, now being released, will show that only two or three important companies still were operating on a profitable basis. United States Steel's deficit of $71,000,000 not only is staggering in amount, but represents the first annual loss incurred by the corporation in its 32 years.

There will be much speculation as to whether or not the point of largest deficits have been passed. United States Steel's fourth-quarter showing was better than its third-quarter report in that the loss was $4,000,000 less. Bethlehem's fourth-quarter deficit was just a shade larger than that for the previous quarter, and the reports of many of the other independents showed only slight changes from the third-quarter. The evidence seems to indicate that iron and steel companies in the final months of last year were gaining better control of the situation and that in the first three months of the new year marked improvement on the part of the more alert companies may be expected.

Behavior of Operations in February May Indicate Character of 1933 Trend

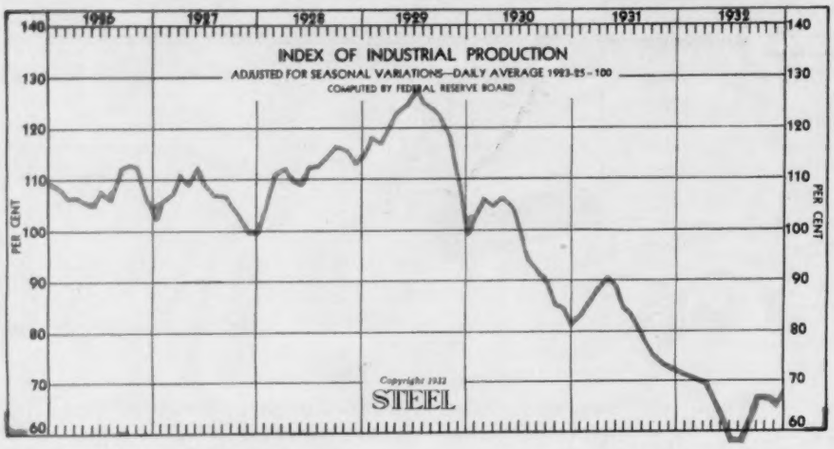
Such improvement will be assured if operations continue to expand slightly throughout the remainder of the quarter. Production of steel ingots in January exceeded that of December. If operations through February should average 19 per cent—which would require only a maintenance of the current rate—then the second month would more than match November in output. To surpass October, March would require an average operating rate of only a shade over 19 per cent. Therefore, if we can assume that the companies will enjoy economies in the current quarter as great or greater than were practiced in the final quarter of 1932, the chances for a better financial showing appear to be good.

February will be a critical month in steelworks operations in that the trend in that period may give a hint as to whether the curve of operations will rise gradually through the quarter, as in 1931, or taper off rather promptly, as in 1932.



1932	
Jan. 30	28
Jan. 23	27
Jan. 16	26
Jan. 9	25

1933	
Jan. 28	19
Jan. 21	18
Jan. 14	17
Jan. 7	16



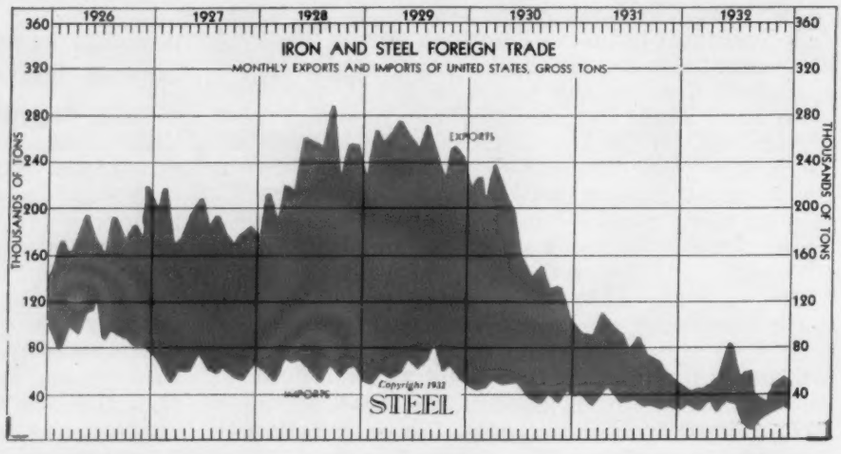
December, 1932	66
November, 1932	65
December, 1931	74

Industrial Production Shows Slight Gain in December

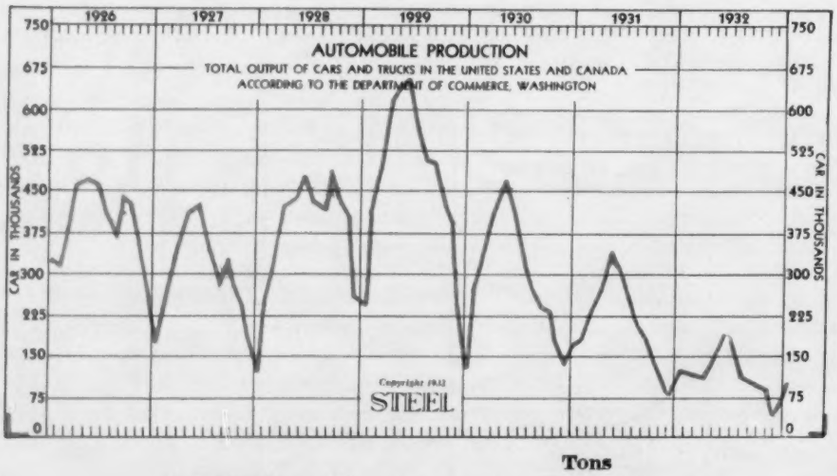
The index of industrial production as reported by the Federal Reserve board was up one point in December to 66. This compares with 65 for November and 74 for December 1931. Among the component parts of the index manufacturers was 65 which compares with 64 in November and 73 in December last year. In the manufacturing group, iron and steel in December was 27 compared with 31 in November and 42 in December, 1931.

Iron and Steel Export Trade Suffers in 1932

Both exports and imports of iron and steel products declined in December. Exports decreased only 1,923 tons for a total of 54,118 tons, while imports fell off 3,534 tons for a total of 29,390 tons, according to the iron and steel division of the department of commerce. Figures for the entire year 1932 reveal a tremendous loss in steel exports the total being only 594,691 tons, compared with 968,992 tons for 1931.



Exports	Tons	Imports	Tons
December, 1932	54,118	December, 1932	29,390
November, 1932	56,041	November, 1932	34,924
December, 1931	57,263	December, 1931	25,812



	Tons
December, 1932	109,542
November, 1932	61,761
December, 1931	123,973

Automobile Output Up in December; 1932 Total Down

Production of passenger and commercial motor vehicles in the United States and Canada in December totaled 109,542 units, a sharp gain from the 61,761 established in November. The December output embraced 87,469 passenger cars, as against 48,962 in November, and 21,782 trucks, compared with 12,560 in the preceding month. With December figures available the grand total for 1932 becomes 1,431,544 units, 246,404 of which were trucks. The comparative figures for 1931 are 2,472,359 total units.

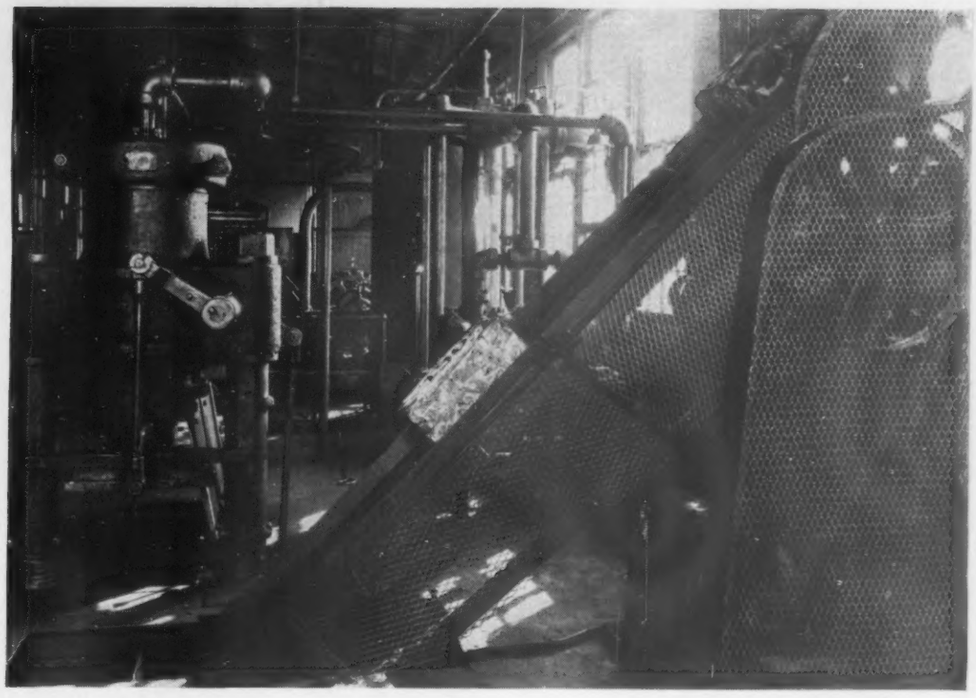


FIG. 1—A baling press facilitates ready and efficient disposal of ferrous sheet metal scrap. The inclined conveyor carries the compressed bales directly to a flat car for shipment

CAREFUL SALVAGING OF WASTE MATERIALS IS SALIENT ECONOMY MEASURE

IN THESE days of rigid economy, manufacturing plants are checking every source of waste. The larger the company, of course, the greater the saving which can be made through salvaging operations. It is not surprising, therefore, to find in manufacturing departments, aside from the keenest interest in building apparatus at lowest cost consistent with quality, a thorough knowledge of the items entering into the so-called "overhead" and the necessity of keeping these at all times down to the minimum. Constant study is given to all operations and materials with a view to their steady improvement; and, involved with this, is a continuous scrutiny of the "waste-flow" of materials to see whether or not these can be reduced, salvaged or eliminated.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., always has been a strong advocate of scientific management. It has accordingly not only kept buildings and equipment abreast of the times, but has given even more attention to the development of its personnel along broad lines. A materials disposition department or its equivalent is located at each of the various plants, and as its name rather implies, controls the disposition of all waste, surplus and obsolete materials, raw and finished, as well as of such used and off-standard apparatus and products as may from time to time accumulate.

By "control" is meant not only that permission must be obtained from this department before any items can be disposed of; but, disposition also must be made along the lines directed. The only exception to this procedure which is permitted, is the scrapping of legitimate turnings, borings, filings, punchings and small pieces of bar, rod, tube and plate material.

From the foregoing brief statement, it will be inferred that a regular procedure is in effect, not alone for the orderly handling of items of every kind used in manufacturing, including the storing of approximately 60,000 such, but for their regular checking at intervals.

Notwithstanding the

By C. B. AUEL

Manager, Employes' Service, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

most careful checks, however, accumulations of various kinds, as already intimated, tend to occur and it thus becomes the function of the materials disposition department to take these in hand and arrange for their disposal or application to the best advantage. Having a number of plants located at strategic points over the country, a system of exchange lists has been developed whereby every plant is kept informed of all surplus or inactive materials on hand and these lists are regularly consulted by the respective stores and purchasing departments, materials being taken from them whenever possible and used either "as is" or by modification. In so doing, it is recognized of course that the company is its own best customer, since the highest possible salvage values can be obtained by using the materials within the organization.

If application, however, cannot be made by any of the various plants, these materials may then be disposed of either (1) by turning back to the supplier for credit or exchange; (2) by selling in the open market through advertisements in trade magazines or to dealers; or finally (3) by scrapping and salvaging.

Salvaging lends itself to study in the same manner as any other subject and where the quantities are sufficiently large and diversified, such study pays good dividends. It involves a study of parts and materials with an eye to their reclamation to the best advantage, and not simply to their disposal as scrap. Those in charge of this work naturally must have a broad knowledge of the properties of materials passing in review before them and their possible uses, as well as keen imagination for new applications.

But salvaging, no matter how effective it may be, invariably involves a loss of some kind. Even if the material be eventually reclaimed at full value, there is still the loss of interest on capital tied up from the time of purchase or manufacture to ultimate use. Salvaging must, therefore, go hand in hand with the study of waste prevention; in other words, while attempts are being made to prevent, if at all possible, a repetition of the cause which led to the accumulation. Preventive measures are therefore, of the two, much the more important.

Fig. 2—Electric arc welding here is used advantageously in the repair of a casting in which a defect appeared while it was being machined

It is believed the time will come when every large manufacturing concern will have a well-developed materials disposition department (called by whatever name it may be), and it does not even seem to be beyond the bounds of reason that small plants will feel the wisdom of calling upon consulting engineers to look over their waste problems and recommend solutions.

In the Westinghouse plants are large accumulations of what really may be called legitimate scrap—iron, steel, brass, aluminum and copper, all being used in large quantities. As any or all of these metals may at times be used in the same departments, it is obvious their scrap can become mixed easily, hence containers for the various scrap metals are suitably located and foremen, workmen and janitors are instructed to keep each variety not only separate, but clean. Too much emphasis cannot be placed upon the nonmixing of scrap and keeping it clean, particularly the nonferrous metals, for any laxity in this respect involves extra work later, in addition to reducing the value of the scrap reclaimed.

Before any filled containers are permitted to be taken from a department, they must be provided with an inspection tag showing that the contents have been inspected and passed; and, if the value involved is over $10, the approval of the disposition department also must be obtained. The only exception to this rule is in the case of a change in design where material to the value of $50 may be scrapped upon authorization from the design engineer.

When it is necessary to scrap more or less finished apparatus or parts for any reason, such as replacement of earlier purchased apparatus by later design, cancellation of an order, etc., it is usually profitable to dismantle the equipment in order to save the pieces or parts, or to salvage the various metals, although if the apparatus is small it may pay to dispose of it to outside dealers without dismantling.

Salvage Stations Scattered

Salvaging operations are varied in the extreme and some of them (requiring certain individual tools) can be grouped together in a separate department and the work done to advantage in this way, since the labor employed may be said to be only semi-skilled and the cost therefore will not prove excessive. Other such work and tools belong in the manufacturing departments, where similar operations are performed regularly, while still other tools may be classed as portable and carried afield as occasion requires.

While formerly much scrap metal was sold to dealers in its original form or shape, lately more and more of this reclamation work has been done by the company, and the list now includes iron, steel, copper, brass and bronze, antimony, lead, zinc, tin, solders, etc. Aluminum dross is sold, as is brass when in excess of needs, the metals first being run into ingots.

Nonferrous metals, if in wire or equivalent shape and small, are baled in a press without any attempt at removal of the insulation usually on them; but, if the insulation is large or heavy, it is first burned off. The bales weigh about 200 pounds each. Obsolete sizes of copper wire and strap, made from electrolytic metal, are either redrawn to active sizes or go back into ingots for redrawing, but all other scrap is reserved for castings. Old lead covered cable as well as old babbitted bronze bearings, when returned to the factory for any reason, are run through a furnace

and the lead or babbitt melted off, after which the copper and bronze are remelted. Brass foundry ashes are collected regularly, crushed to proper fineness and with floor sweepings are put over a Wilfley separator table.

A profitable innovation has been made in the design and construction of foundry flasks from welded channels, these replacing to a considerable extent the cast-iron flasks previously used, with not only a reduction in cost but also a certain saving in replacement. There is a further potential saving in that, should the present sizes become obsolete, the flasks can be broken apart readily and reconstructed into smaller sizes. This practice follows somewhat the use of welded jigs and fixtures which the company has designed and built for some years past.

Transformer Oil Re-used

Returned transformer oil, formerly used in the oil furnaces, is now, together with the sludge from the oil storage tanks, used to better advantage in the diesel yard locomotives. Another outlet for discarded oil from transformers, oil breakers, compressors, etc., is in the form of cutting compounds for machine tools.

Some years ago a special steam sandblast was installed for the resharpening of dull files and after a certain amount of experimental work the practice was perfected and has since been continued with a resultant tremendous saving in the purchase of new files.

A baling press located on the ground floor in the metal stamping department expedites the ready and efficient disposal of all ferrous sheet metal scrap and at prices higher than could be obtained if the material were not baled. All sheet scrap is carried to the press, (a chute being used for material on the upper floor) and compressed into convenient bales. From the press these bales are taken by a conveyor, as shown in Fig. 1, directly on to flat cars for transportation to their final destination. Experience on the part of operators in mixing large and small pieces together permits baling even the smallest pieces of scrap, which would otherwise require separate handling. A press of this type not only eliminates almost entirely a series of awkward, expensive and slow hand operations but also largely reduces the accident hazard of stepping on or being cut by sharp edges of scrap.

More recent additions to the equipment of many salvaging and reclamation departments are the electric and gas cutting and welding torches and tools. Steel and wrought iron, when awkwardly located or when of inconvenient size either as to weight, length or shape, can be cut up readily with the electric arc or the gas torch, and thus more easily disposed of or moved. For the lighter work, both in bar and plate stock, the alligator shear, however, has the advantage. Welding tools are used to advantage in joining together short pieces of bar stock, wire, tubing and pipe, although judgment must be used in selecting the economical point at which to stop.

FIG. 4—Costs of various machine parts, exhibited in this fashion, help to educate employes in their proper maintenance

SEC. E&O
HELP TO ELIMINATE WASTE BY HANDLING INSULATED COILS CAREFULLY.
Stone Age Tools "YOU" cannot save this way
Found In scrap can
216 Ordered 36 needed 180 surplus
Bad weld causes a loss of $26.60
$6.84.40
Sawed by checking length of cable leads on this job
Found in Scrap Can
26 ft.
51 ft.
14 ft.

FIG. 3—Waste exhibits of this type, set up in the plant, are of valuable assistance in campaigns to reduce material wastes

Welding Saves Time, Money

Fig. 2 illustrates the use of the electric arc in the welding of a steel casting. The casting was being machined, considerable labor already having been expended upon it, when a blowhole was encountered. A few minutes' application of the arc and without even removing the casting from position it was as good as new, thus saving a large item of expense as well as avoiding the delay in awaiting the replacement of the piece.

The forging hammer is another busy piece of equipment in the reclamation department. Forged cutting tools, when too short for further use, can be forged out to the next smaller size of similar tool so that practically only the stub ends of the smallest sizes of stock need be disposed of eventually.

In the disposal of cast-iron scrap,

the skullcracker continues to be the main tool, although modern practice calls for its operation either in a sufficiently deep pit or within an enclosed fence, to prevent accidents from flying pieces.

Briquetting of turnings and borings is of fairly recent origin and is an economical operation when the quantities of such material to be handled are sufficiently large to warrant the cost of a briquetting installation. In the Westinghouse foundry, electric furnaces now being installed will be arranged, for the most part, so as to allow turnings and borings to be charged into them just as received from the various manufacturing departments.

Savings in Sand

Synthetic molding sand came into use in European countries earlier than in the United States, perhaps because of a dearth of such natural sand, but the former is now used in all countries. The chief factor in favor of synthetic sand is that with the addition of a bond it may be used repeatedly. In a large foundry where the volume of "burnt" sand is considerable, the handling, transportation and disposition of such a waste product becomes an expensive matter. These objectionable features are overcome by synthetically compounded sand which can be used over and over again.

Another economy which with care may be made in a foundry is in the use of sawdust and finely cut shavings as filler for the making of cores for many medium and large size castings. When used it is desirable to make the cores as weak as possible so that they will collapse readily in the molds immediately after the castings have solidified. By using this waste from the pattern shop in the core sand mixture, cores are obtained that are light and porous, and, due to the burning of the shavings after pouring, fall to pieces, thus tending to prevent strains in the castings. In a foundry with an output of 2 to 3 million pounds per month, of which a goodly percentage is medium and large size castings, all sawdust and shavings from the pattern shop, totaling 10 to 15 tons per year, can in this way be used to far better advantage than if burned under a boiler for heat.

A certain amount of sawdust also is kept on hand ordinarily for extinguishing oil fires when these arise occasionally in the testing departments. Scattered over such a fire in its early stage by means of a wide scoop shovel, it serves its purpose admirably.

A portion of foundry coke, too fine for melting purposes, is obtained as a residue from the stock pile when forking the coke into the cupolas. This coke breeze amounts to as much as 3 per cent of the total coke purchased and it can be used similarly to shavings in building up cores and in bedding molds when rapid expulsion of waste gases is required when the molds are pored. Cinders from air furnaces, as well as ashes from boilers, also can be used for this purpose.

Small pieces of wood which accumulate in the pattern shop are used both for heating ladles in the iron foundry and for firing the cupolas. An occasional instance may occur where certain varieties of such wood can be sold to outside manufacturers, for example, for use in backs of hair brushes.

RECORD LENGTH CLAIMED FOR TUBING: This coil of tubing, recently fabricated by the Fretz-Moon Tube Co. Inc., Butler, Pa., was made by the special welding process developed by the company. The process is similar to the regular practice of heating skelp for fabrication of butt welded pipe. The above tubing was produced from skelp 0.068-inch thick, 1 13/32 inches wide; with a finished size of 0.068-inch wall thickness and outside diameter of 0.405-inch. The length of tubing was coiled hot onto the display stand shown in the illustration as it came from the welding rolls

Employes' Aid Sought

In efforts to eliminate material wastes and reduce unnecessary expenses, too little attention heretofore has been paid by many plants to the possible assistance to be derived from the employes themselves. The Westinghouse company, recognizing the value of such help, has accordingly regularly participated in the National Elimination of Waste Campaigns under auspices of the American Society of Mechanical Engineers, with the American Management association co-operating. During these campaigns bulletins are posted in all departments announcing the campaign and asking the help of employes, inviting suggestions from them through the medium of a plant "suggestion system."

Of the greatest assistance has been the development of departmental waste exhibits, traveling, portable and stationary, showing various items spoiled or used in unnecessarily large amounts. Such exhibits are illustrated in Figs. 3 and 4. A unique feature of these boards is that the cost or selling price is placed alongside of each item in order to familiarize the employes with such values, for it has been found that little knowledge exists among them as to costs. There is really no reason, when thought is given to the matter, why employes should be expected to know costs since no effort has been made to teach them.

In addition to these waste exhibit boards displayed during the campaign, this educational work is carried on throughout the balance of the year by means of illustrated articles in the shop magazine, a few items with their costs being incorporated in each issue. Cost of defective workmanship, carelessness, etc., is strikingly shown by occasionally contrasting the raw and finished costs and scrap values.

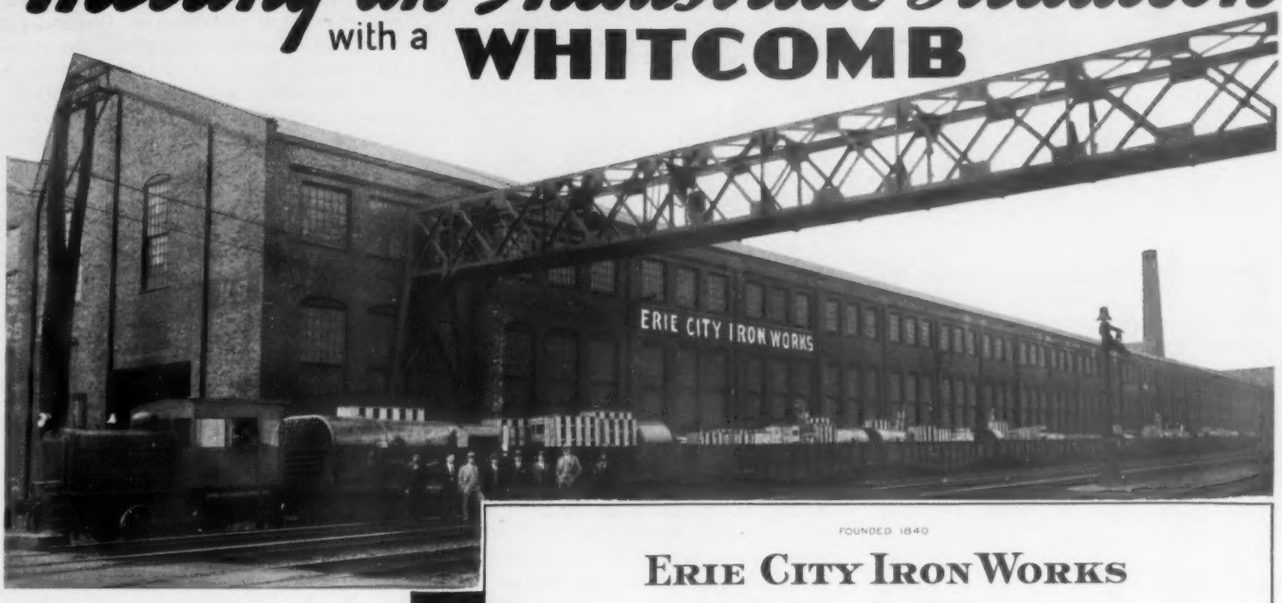
Making Chip-Proof Enamel Ware by New Method

Federal Enameling & Stamping Co., McKees Rocks, Pa., is producing a new type of enamelware on which it is claimed the surface is chip-proof. The kitchenware is being fabricated from one piece of sheet steel, with the exception of the handles. The method of enameling the surface is as yet undisclosed, pending patent grant. Sheet metal being used ranges from a 18 to 20-gage tin mill black sheet produced by a mill in the Pittsburgh district. The utensils have "vapor-seal" chromium covers and bakelite knobs. Bottoms of the containers are enameled black which, according to tests, affords a 10 to 40 per cent saving in fuel.

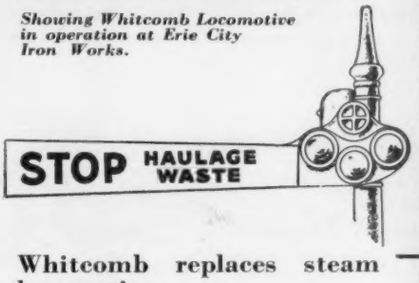
Bulletin on Monel Metal

Engineering properties of monel metal are described in bulletin T-5 recently issued by the development and research department of the International Nickel Co. Inc., 67 Wall street, New York. Physical constants, strength and ductility, corrosion resistance, description of mill products, working properties and details of composition of the metal are included in the 8-page bulletin, available without cost upon request.

Meeting an Industrial Situation with a WHITCOMB



Showing Whitcomb Locomotive in operation at Erie City Iron Works.



Whitcomb replaces steam locomotive.

Whitcomb economy service reduces costs.

Always ready for service.

Whitcomb operation costs much less than steam.

Send for latest bulletin on Industrial haulage problems.

THE WHITCOMB LOCOMOTIVE COMPANY

Subsidiary of The Baldwin Locomotive Works

ROCHELLE ILLINOIS

FOUNDED 1840

ERIE CITY IRON WORKS

STEAM POWER PLANT EQUIPMENT

N. M. WALLACE
PURCHASING AGENT

ERIE, PA.

December 16, 1932

The Whitcomb Locomotive Company
Rochelle, Illinois

Attention: Mr. C. W. Chappelle

Gentlemen:

Replying to your letter of November 30th, we placed in service one of your 20 ton Whitcomb gasoline locomotives in January 1930. This locomotive replaced a steam locomotive that we had previously used for a number of years for plant switching.

Due to the layout of our plant and the numerous different shops to be served our plant locomotive is called upon for considerable switching and we have found the Whitcomb to be very satisfactory not only from the standpoint of service but also because of its flexibility and the substantial cost reduction afforded.

Another feature of this locomotive which appeals to us very much is that it is always ready for service on a moment's notice. This feature has been especially valuable during the present period of depression.

We are attaching photograph of our Whitcombcoupled with one of our shipments of boilers which we made to Russia in 1930. This picture was taken on the New York Central Siding adjacent to our boiler shop.

We have had this locomotive in service now about three years and our experience with this has been very satisfactory. We have had very little difficulty with it and the cost of operation has been much less than the steam locomotive.

Yours very truly,
ERIE CITY IRON WORKS
N.M. Wallace,
Purchasing Agt.

NMW:LEB
enc.

ABMA

WHITCOMB LOCOMOTIVES

Stainless-Clad Steel Adapted To Tonnage Production

By S. L. INGERSOLL
Vice President and Director of Research,
Ingersoll Steel & Disc Co.

CONSTANT improvements in the methods of melting and rolling and lower prices of component elements have tended to bring down the ultimate price of the stainless steels; however, there is a limit beyond which further cost reductions can not go. No way has been found to lessen the cost of solid stainless metals and still retain their desirable heat, acid and corrosion resisting properties.

Early in the development of stainless steels, it occurred to many metallurgists that a solution to the problem was to produce a combination material having a thin surface of stainless steel and a base or back of low-cost metal. For nearly ten years, experimentation has been directed toward the perfection of such a combination metal, but until comparatively recently no successful method was evolved which would assure in tonnage production a perfect weld between the stainless surface and the base metal.

Process Recently Perfected

Among those companies devoting research to this problem was the Ingersoll Steel & Disc Co., Chicago, a division of the Borg-Warner Corp. This company has produced many two-ply metals in its 20 years of experience in the manufacture of agricultural implements and cutlery steels, but it was only recently that the organization perfected a process to join together successfully on a large production basis such remotely related members of the steel family as stainless and mild steel.

The method employed in producing the new material, which has been designated Ing-O-Clad stainless steel, consists of rolling the finished sheets of the stainless clad mild steel from a composite ingot. The stainless surfaces are polished before the mild steel is applied in a manner which eliminates the possibility of scale, pit marks, slivers or roll marks appearing on the stainless surface during rolling. The process of combining the two metals in the ingot assures a complete and perfect welding throughout the entire surface of the sheets.

Any one of a number of compositions for stainless steel are employed, since the company holds license agreements for the use of various alloys having large tonnage potentialities. The process assures not only a complete uniformity of thickness of both the stainless and mild steel plies, but also allows variation in the thickness of each ply to produce a finished two-ply sheet or plate of any practical size. In other words, there is a wide latitude which will permit production of two-ply metal to satisfy the requirements of a wide range of commercial applications.

Several aspects of this stainless-clad steel merit the attention of the user and fabricator. With their usual small percentage of stainless surface, the sheets or plates may be deep drawn, stamped, formed, welded and highly polished. Possibilities are offered in the form of tubes and pipes, bars and shapes, as well as sheets.

It is well known that most of the solid stainless steels require approximately 50 per cent heavier equipment for fabricating than do soft steels. This new two-ply metal, on account of its relatively small percentage of the tough and resistant stainless surface, can be fabricated with the same equipment used on corresponding gages of ordinary soft steel.

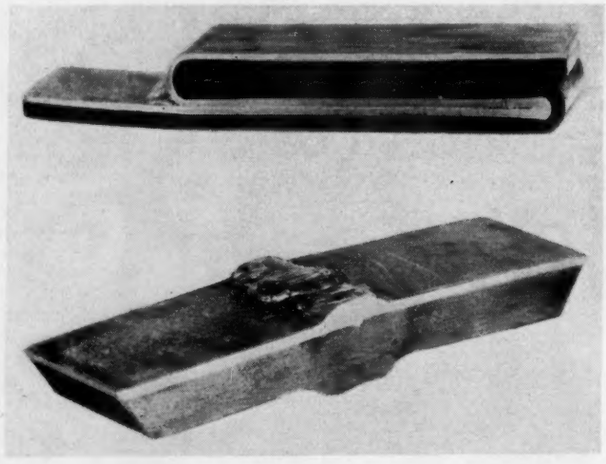
Two-ply stainless can be welded by oxyacetylene and electric processes. The procedure of welding has been worked out thoroughly with the leading gas and electric welding companies and they should be consulted when work is undertaken. Depending upon the various gages of the two-ply metal, these companies have developed thoroughly successful methods for producing lap, butt, vee and flange welds, which assure a perfect weld embodying all characteristics of the stainless surface.

Welding Technique Developed

For the thinner gages, as from 16 to 10 gage, a close fitting butt weld may be made using a stainless steel welding rod. The weld should be made from the stainless side and, with proper amperage for the various thicknesses of plate, a homogeneous stainless weld for both plies is effected.

For the thicker gages, it is recommended that the edges of the plate be veed from either the stainless or the mild steel side. To reach the bottom of the vee, a small-gage welding rod is recommended, using larger rods as the mouth of the vee is approached. As the weld gets well beyond the stainless ply, it may be completed using less expensive rods than the stainless, at the same time assuring a perfect junction between the two metals.

The present selling price of the two-ply stainless clad steel is from 40 to 50 per cent less than the cost of solid metals of like characteristics, which will bring it within the reach of countless applications in which the resistance of a stainless surface has been desirable, but for which the cost of solid metals has made its use uneconomical. The fact that the process of manufacture so lends itself to large tonnage production indicates that the major uses will be in the mining, process, food and metalworking branches of industry, rather than the more limited fields



SHORT radius bends, shown above, do not rupture the bond between the stainless and mild steel. A standard butt weld of two-ply stainless steel is shown below. Stainless rod is used on the upper surface and low-carbon rod on the mild steel ply

WELDABILITY *of the* ALLEGHENY ALLOYS

ALLEGHENY METAL
Used wherever maximum resistance to corrosion and permanent beauty of service are desired.

ALLEGHENY 22
For applications demanding maximum resistance to chemical corrosion coupled with facility of fabrication.

ALLEGHENY 33
Where resistance to progressive corrosion is necessary and where surface discoloration is not objectionable.

ALLEGHENY 44
Where maximum heat resistance coupled with ease of fabrication is essential.

ALLEGHENY 46
Where strength at high temperatures, resistance to corrosion and facility of fabrication are required.

ALLEGHENY 55
Where maximum temperature resistance is needed,—but where no difficult fabrication is involved.

ALLEGHENY 66
Where resistance to chemical and atmospheric corrosion coupled with facility of fabrication are desired.

A technical Bulletin describing any one or all of the Allegheny Alloys will be sent promptly on request.

Allegheny Metal as well as the Allegheny Chromium-Iron Alloys may be very satisfactorily welded by the commonly accepted methods, such as oxy-acetylene, electric metallic arc, carbon arc, electric spot or electric compression butt methods. The welding technique is somewhat different inasmuch as Allegheny Metal's coefficient of expansion is 50% greater than mild steel, with only 48% of the thermal conductivity.

The electric method of welding is most desirable as it produces a weld with a lower carbon content than other methods and is usually much faster, and therefore more economical. As Allegheny Metal is non-hardening at any temperature,—no embrittlement occurs during the welding operation.

In the case of Allegheny Alloys 33 and 66, the weld should in all cases be locally annealed, inasmuch as the metal having been raised above the critical temperature and allowed to air cool, will be hard and brittle and must therefore be tempered at a temperature of about 1400-1450 degrees F. to bring back its ductility.

Our engineering department will be glad to cooperate with you on any specific welding problem that you may have,—a booklet giving helpful suggestions on the welding of the stainless alloys is yours for the asking.

ALLEGHENY STEEL COMPANY

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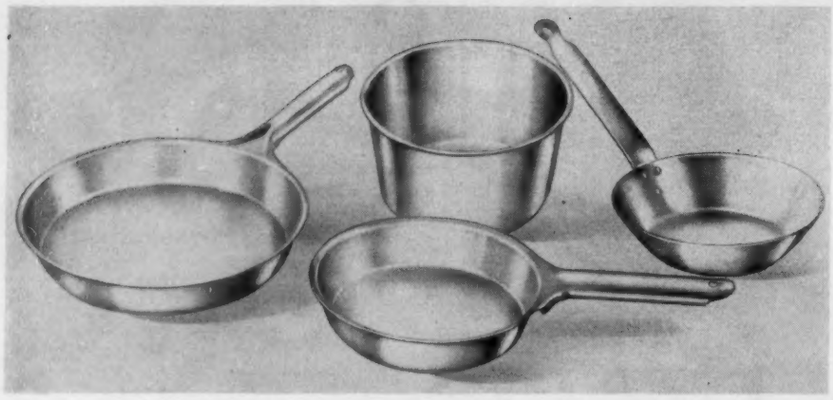
ELECTRICAL SHEETS STEEL CASTINGS SEAMLESS TUBING
BOILER TUBES PIPE



Cooking utensils made from two-ply stainless steel. The stainless inside surface resists discoloration and corrosion from foods; the mild steel under surface improves heat conductivity

such as instruments, cutlery, small hardware, tools, tableware, etc., where the solid stainless metals have found such excellent application.

The character of the two-ply metal limits its use to those applications in which a continuous surface is exposed to corrosion, heat or abrasion. Thus it will not ordinarily be used where the application involves piercing the metal as in screens, gravel and ore graders, etc. However, for tanks, vats, kettles and digesters, the stainless-clad sheets will find wide application where the acid problem falls within the resistant properties of the surface.

The ability of stainless steels to resist mine waters undoubtedly will result in the two-ply metal being used for such applications as launders, bucket and chute conveyors and pipes. The chemical industry will employ the material in rotary bleaching boilers, storage tanks, blow and drainage pit bottoms and sides, storage tanks, chests and digesters.

Uses Said To Be Countless

This new metal has been used with complete success in several of the process industries in cooking vessels, vats and tanks. Likewise, the automotive industry has employed it for hardware, metal wheels, and other applications in which high polish and resistance to atmospheric corrosion have been dominating factors. In the field of kitchen utensils, the stainless surface resists discoloration of foods and the mild steel under-surface gives greatly improved heat conductivity at the skillet, sauce pan or kettle.

This list could be carried on through many of the process industries, citing applications of stainless-clad metal which would prove economical and result in longer life to the equipment—equipment which probably would have used some of the many grades of solid stainless steels were not the initial cost of the installations prohibitive.

In applications where some degree of protection or polish is desired on the mild steel side, as well as that furnished by the stainless surface, the carbon steel side may be given a low-temperature enamel coating; it may be protected by aluminum, asphaltic or other resistant paints; and it may be plated by any one of a number or processes.

Canadian Company To Build Steckel Hot Strip Mill

The first wide hot strip mill of the Steckel-type for commercial use will be built for the Dominion Foundries & Steel Co. Ltd., Hamilton, Ont., it has been announced by officials of the Cold Metal Process Co., Youngstown, O., owner of the Steckel patents.

The mill, experimental rolling on which was demonstrated to American and foreign steel men in Youngstown last summer, will be built for the large part in Canadian shops, the prevailing exchange rate making its construction in the United States uneconomical.

The Steckel wide strip mill differs radically from the continuous wide strip mills built previously (STEEL, June 13, 1932). It has only one stand of 4-high rolls. Two reversible coil drums are placed in furnaces on each side of the stand and the passes are made from coil to coil. Slabs 4-inches thick will be hot rolled to 16-gage.

The Canadian company will utilize the new mill to make strip for tin plate, blue annealed and black sheets directly from mold-poured slabs, eliminating the customary blooming mill.

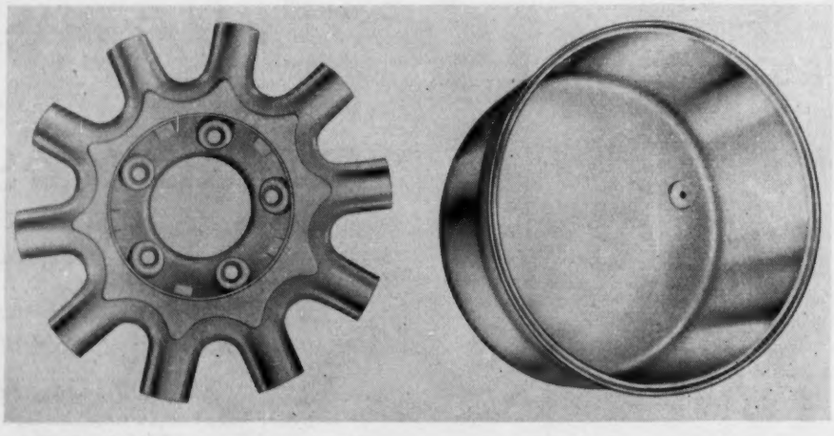
Cleveland Steel Treaters Arrange Lecture Course

Approximately 150 metallurgists and engineers from Cleveland metalworking plants on Jan. 30 attended the first of a series of 12 lectures on "Modern Metallurgy" being conducted at Case School of Applied Science under sponsorship of the Cleveland chapter of the American Society for Steel Treating.

The course, a brief resume of the fundamentals and recent developments in ferrous metallurgy and metallography, has been arranged through co-operation of Case School of Applied Science and is being conducted by Prof. A. A. Bates of the department of mining and metallurgy. Meetings are scheduled for Monday evenings, concluding on May 15.

The first three lectures will be devoted to "Manufacture of Iron and Steel," after which two will deal with "Metallography of Iron and Steel" and two more with "Heat Treatment and Hardening of Steel."

The course will conclude wih a series of special lectures on "Alloy Steels," by J. V. Emmons, metallurgist, Cleveland Twist Drill Co.; "Manufacture and Metallography of Gray, White and Malleable Cast Iron," by H. A. Schwartz, manager



A stamping of two-ply stainless steel used in artillery-type automobile wheels is shown at the left. Deep drawing possibilities of stainless-clad steel are exemplified in the seamless washing machine tub at the right

of research, National Malleable & Steel Castings Co.; "Manufacture and Metallography of Brass and Bronze," by H. P. Croft, metallurgist, Chase Brass & Copper Co.; and "Metallurgical X-Ray Applications," by K. R. Van Horn, research metallurgist, Aluminum Co. of America.

Platen Press Is Unusually Large

A STEAM platen press, capable of applying the enormous pressure of 10,000 tons or 20,000,000 pounds on the platens, and claimed to be the heaviest tonnage press of its kind built, recently was completed and shipped by the Lake Erie Engineering Corp., Buffalo, manufacturer of hydraulic machinery. This press, shown in the accompanying illustration, is of the three-opening type with four steam plates 48 inches wide and 144 inches long.

Pressure Through 12 Rams

The pressure is effected by means of twelve 18-inch rams at 6500 pounds per square inch hydraulic pressure. The press is of steel construction throughout with the exception of the semisteel rams. The columns are of a special alloy steel showing ultimate tensile strength of over 120,000 pounds from test bars.

The manufacturer put the press through an exhaustive test in its shops and the deflections of the platens were measured accurately. The greatest deflections anywhere in the platens did not exceed 0.004-inch under actual working loads as measured by the customer's inspector. This is said to be an exceptionally low deflection for such a heavy tonnage press and is regarded as a good example of skillful design and workmanship on such a large and massive piece of equipment.

Ceramic Society Will Hold Meeting and Exhibit

Thirty-sixth annual meeting of the American Ceramic society will be held at Hotel William Penn, Pittsburgh, Feb. 12-17, coincident with the second meeting of the National Brick Manufacturers Research foundation and an exhibit of ceramic materials and equipment. Immediately following the meeting of the ceramic organization, the American Refractories institute will convene at the same location, Feb. 17 and 18.

Eight divisions of the ceramic society will hold technical sessions during the meeting. Papers of interest to representatives of the steel industry and included on the program of the refractories division of the society are as follows:

Symposium on the "Physical Chemistry of the Alumina-Silica Refractories"—a continuation of the symposium on this subject held at the 1932 meeting, special attention to be devoted to the problem of structures as revealed by X-rays.

"Constitution and Thermal Expansion of Silica Coke-Oven Brick After Service," by J. B. Austin and R. H. H. Pierce Jr., research laboratory, United States Steel Corp., Kearny, N. J.

"Thermal Conductivity of Magnesite Brick," by Gordon B. Wilkes, Massachusetts Institute of Technology, Cambridge, Mass.

"The Linear Expansion of Refractories to Temperatures as High as 1800 Degrees Cent.," by R. A. Heindl, bureau of standards, Washington.

"Equilibrium Studies in the System Magnesia-Iron Oxide," speaker to be announced.

To Revise 1931 List of Research Laboratories

The research information service of the National Research council, Washington, is preparing a revision of its "Industrial Research Laboratories of the United States, Including Consulting Research Laboratories," the fourth edition of which was published in 1931 and contained over 1600 such laboratories.

Every effort is being made by the council to assure the completeness of the volume by listing all known research laboratories. Data included are made up of the name and address of the companies, the research directors and the research problems engaging the attention of the laboratories. There are also included an alphabetical list of research directors, a subject index of research interests and a geographical index of companies. The bulletin will not be available for distribution before September.

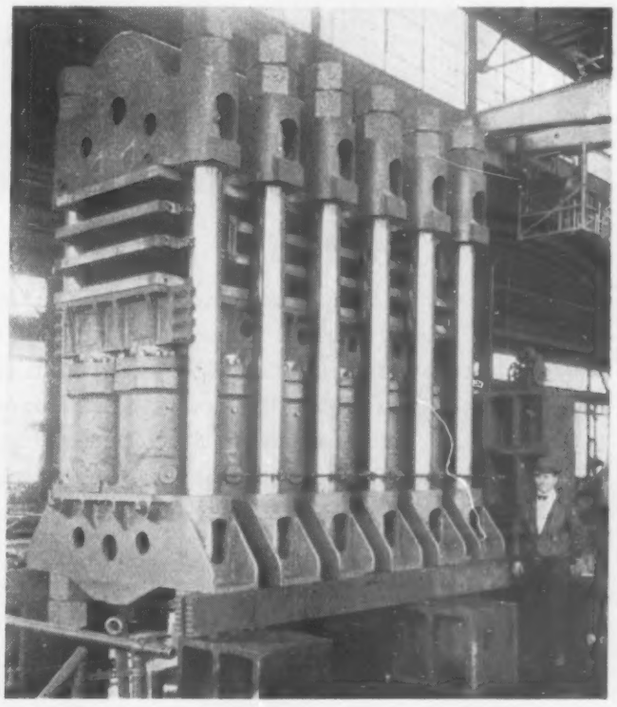
Provides X-Ray Tests of High-Temperature Castings

Electro-Alloys Co., Elyria, O., has retained as consultants the Victoreen Instrument Co., Cleveland, specialists in X-ray radiography, and is prepared to render to its customers a new service by furnishing radiographs of the high temperature alloy castings which it manufactures. The service is available at only a slight additional cost.

It is the opinion of the Electro-Alloys company that fully 90 per cent of premature failures of alloy castings may be attributed to foundry defects which are not visible to the naked eye and which the X-ray will reveal. The new service, therefore, is considered as a form of insurance and guarantee.

Holds Lighting Conference

A conference on the "Economics of Applied Lighting" will be conducted at Case School of Applied Science, Cleveland, Feb. 8-9. This conference, dealing with lighting in all of its phases, will include papers and discussions on industrial aspects of the subject. Many prominent speakers will participate.



THIS steam platen press, claimed to have the heaviest tonnage of any built, applies a pressure of 10,000 tons on the platens. It is of the three-opening type, with plates 48 inches wide and 144 inches long. Deflections under load not exceeding 0.004 inch are regarded exceptionally low

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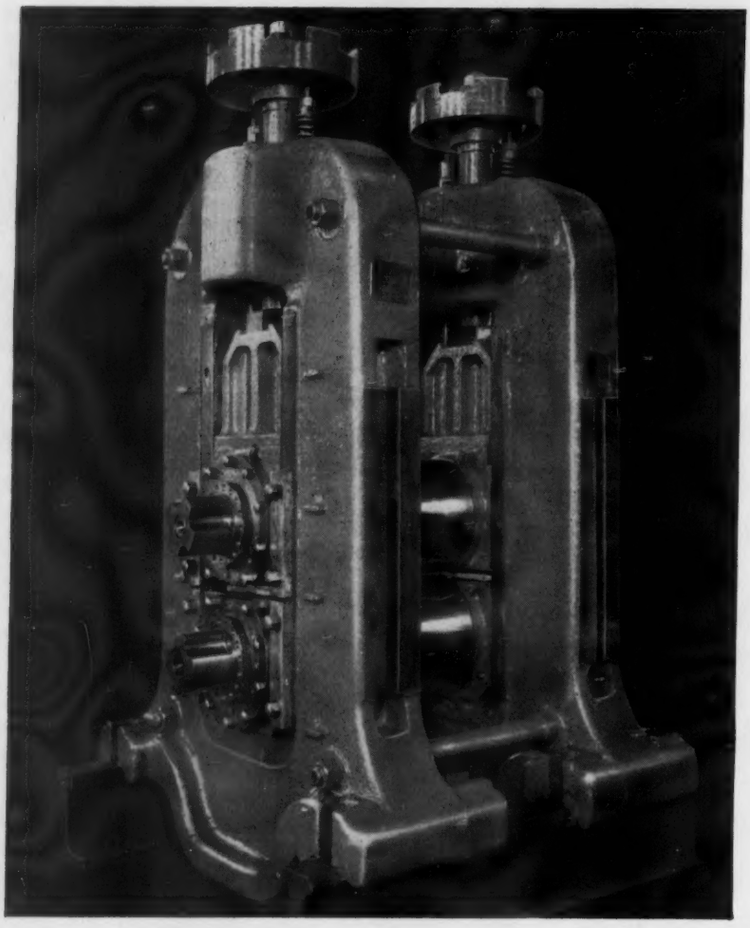

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Making the Most of

METHODS AND MATERIALS

AN INCREASE in production per machine hour of 15 to 18 per cent was obtained by a large die casting company when its die casting machines were converted from oil to gas firing and automatic temperature controls were installed. Each furnace contains a cast-iron pot and goose neck and is fired by a two-stage, high-pressure burner utilizing gas at 10 to 15 pounds pressure. Life of the pots was increased from an average of 11 weeks to an average of 16 weeks. Rejects caused by the metal being at improper temperatures were practically eliminated. The average gas consumption required to melt down 320 pounds of cold metal and heat to 1250 degrees Fahr. is 1770 cubic feet of 590 B. t. u. gas. The average daily run of 9 hours requires 4590 cubic feet or a total gas consumption for melting down and operating of 6360 cubic feet. Using cold metal charges, the total gas consumption per day is 8450 cubic feet. The production per day varies from 1500 to 3300 pounds, depending upon the type of castings being made.

$ $ $

A manufacturer in New York is grinding driving rolls in 7.5 minutes on a modern centerless grinder, whereas 30 minutes formerly were required on an old style machine.

$ $ $

BY EMPLOYING photoelectric control of its illumination, an eastern manufacturing plant saves 4000 to 5000 kilowatt-hours of electricity monthly, reduces lamp replacements one-fourth, improves production and reduces accidents. A photo tube gages the intensity of the daylight—when the natural illumination drops to 14 foot-candles, the lights in the plant are turned on automatically and when daylight returns to 20 foot-candles the lights are turned off. Approximately 15 foot-candles of light is maintained on the benches of toolmakers and on machine tools and lighting of the entire plant is governed by changes in this level of illumination.. Previous to installation of the daylight control, this plant used 1200 lamps a year, whereas now 900 to 1000 are sufficient.

$ $ $

The ordinary run of fastenings, bolts, studs and foundation bolts need little maintenance, but on some of the larger sizes it often runs into money to buy new ones if the threads have become stripped or if the shanks are bent badly. The welding flame can be used readily to heat bent bolts for easy straightening, and for stripped threads bronze welding rod can be used economically to rebuild the bolt so that it can be machined to correct size. Locked nuts often can be loosened with the blowpipe flame.

$ $ $

Use of an improper type of drawing compound has caused serious trouble in many sheet steel enameling plants. Often the press room or fabricating

department will change the compound without notifying the enameler and as a result an epidemic of trouble hard to trace is encountered. Care should be exercised in selecting the drawing compound, because with the present system of removing the compounds with alkaline cleaners, only certain types can be used successfully. It is safe only to use a proved drawing compound which is cleaned readily with a commercially proved cleaner.

$ $ $

Plates of jaw crushers have been made of 25 per cent chrome steel with 1 to 2 per cent carbon. The addition of nickel in the amounts of 1 or 2 per cent tends to toughen the 25 per cent chrome steel and thus increase its life where shock resistance is a factor.

$ $ $

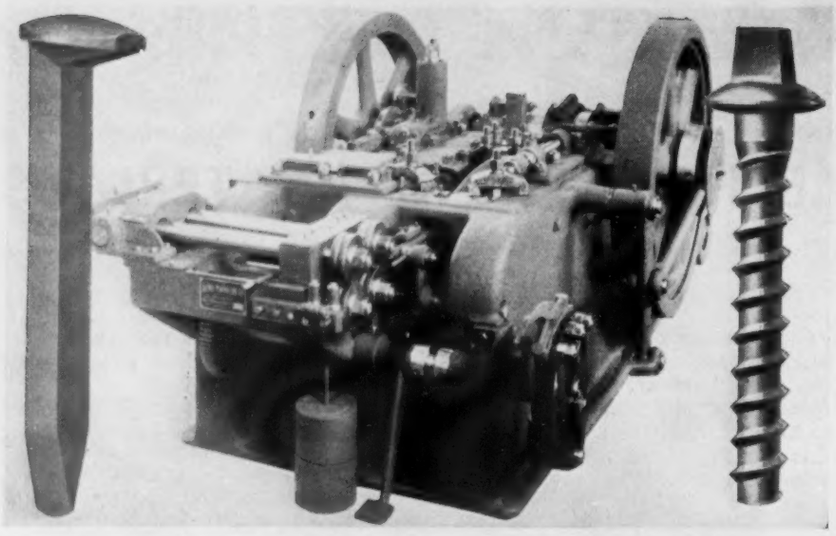
It is estimated conservatively that the present rate of consumption of powdered metal for synthetic alloying and manufacture of pressed parts is on the order of 100 tons per month. It is true that the powdered metals sell at a considerable premium over the purest varieties in ingot form, but nevertheless the articles made are selling at a competitive price. Since new uses are being added continually, and the consumption correspondingly increasing, the production of metal powders at still lower prices is only a question of time. According to an authority on this subject, every cent per pound reduction will increase the field of application enormously.

$ $ $

WOOD cars continue to be used by some mining companies. Comparative figures have shown that the average life of wood cars for certain service was 5 years, while ordinary steel cars in the same service averaged 15 years. Steel cars will take 20 per cent more load and repairs have been found to be 28 per cent less than on wood cars. Consideration now is being given to the use of welded high-strength mild alloy steel for further lightening construction. A suitable steel for this use contains 0.20 to 0.30 per cent carbon, 0.40 to 0.60 per cent chromium, 1.10 to 1.40 per cent manganese, and 0.70 to 0.80 per cent silicon.

$ $ $

In the case of chromium-plated steel dies or other parts subjected to impact, the physical properties of the basic metal must not allow deformation due to this impact. Considerable difficulty was experienced with certain plated steel draw dies which have a shorter life than the unplated dies. Investigation showed that the face of the die was deformed, causing the chromium plate to crack and scratch the work. A different type of steel was used to eliminate this deformation and the chromium plate has been successful ever since.



—Center photo courtesy Acme Machinery Co., Cleveland

Manufacture of railroad spikes has consumed approximately 84,500 tons of steel, as an annual average in the past four years. Illustration shows the standard form of spike, and the screw spike which several of the large railroads now are using. Screw spike blanks are formed in the machine, which also gives them their square heads and collars, the threads being rolled in a separate operation

LARGE USES OF STEEL IN SMALL WAYS

236th Article ◆ Railroad Spikes

RAILROAD rails in this country, amounting to 430,000 miles of single track, are held in place on their ties by approximately 2,000,000 tons of spikes. This is computed from manufacturers' weights of spikes, the number necessary for various weights of rails, and railroads' official data on mileage. The mileage includes yard tracks and sidings, and of this total about 95 per cent is operated by class I railroads—those whose revenue is $1,000,000 or more annually.

Replacement Demand Large

The length of single track has not increased more than 24,000 miles since 1920, but constant need for repair and replacement calls for a large tonnage of spikes. The steel used for their manufacture represents about 15 per cent of the total in making tie plates, angle bars and other track accessories. On the basis of STEEL's official distribution figures, therefore, the consumption for spikes in 1932 was 24,000 tons; 1931, 64,000 tons; 1930, 106,000 tons; and 1929, 144,000 tons; an average of 84,500 tons per year.

Spikes are made from either bessemer or open-hearth steel. Formerly bessemer steel was used exclusively, but now it is common practice to use either, though the greater part of the output is new billet steel. Since most of the spikes are driven into the ties it is desirable to avoid brittleness, so a soft steel is used, according to various railroad specifications. At least two producers now are making spikes from rerolled scrap, or muck bar.

Pointed by Rolling

Stock is rolled on a bar or rod mill. Prior to being fed into the spike machine the material is heated in a furnace taking 20 to 30-foot lengths. The chisel point is formed by being squeezed between two circular rolls with interrupted contour. The heading tool instead of striking straight against the end of the material, as in a nail machine, has a wiping action imparted by means of a cam movement. This not only gives the spike its hook, but by pressing the material against upper and lower dies completely forms the head.

Much more power would be used and much greater wear and tear on the dies would result if the material were pressed into form with a straight blow. Though steel generally is used for the dies, it is understood in some instances a malleable grade of iron now is being cast into the form of dies, and these placed directly into the machine.

The dies are made with considerable accuracy, with spike specifications covering length of head, width and thickness of head, thickness of the heel—that part projecting opposite the hook, and the hook itself. These dimensions vary as one goes up the scale in spike sizes—from 2 to 6 inches in overall length, and from 5/16 to ⅝-inch square in the shank.

The weight of these spikes ranges from 1 ounce, for the 2-inch, used for 12 to 16-pound rails, to 12.8 ounces or more for 6-inch, for 85 to 130-pound rails. The spikes receive no heat treatment after forming, but merely are allowed to cool, then inspected and packed in kegs.

Recently railroad screw spikes have been receiving more attention, as they now are used extensively by at least three important railroads. The standard straight-sided spike holds by friction, but the screw spike, as its name implies, is screwed into the tie, with a flange holding down the rail. Its cost, according to one maker, is nearly double that of a standard spike, and in addition it must be screwed in mechanically.

Blanks Are Thread Rolled

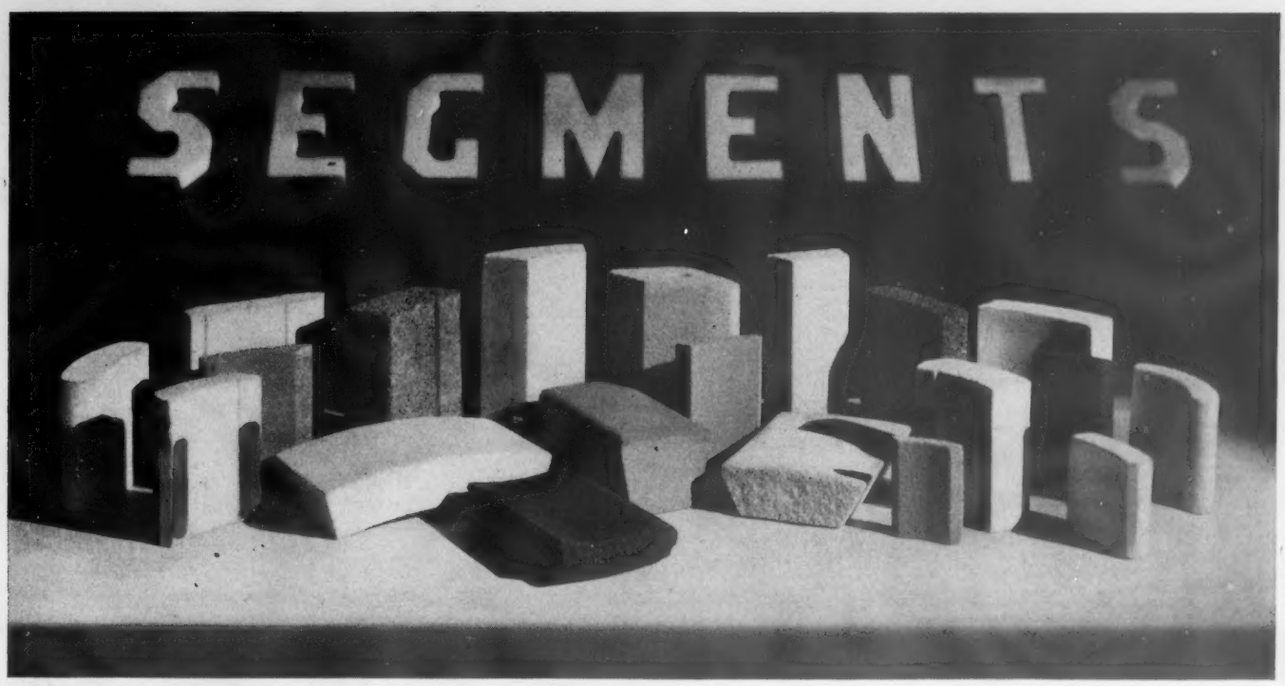
These spikes are made from practically the same material as are the others, and it is fed hot into a blanking machine, shown in the illustration. Here the rod is cut to length, and given that particular type of head, square topped for gripping with a wrench, and wide collar, to grip the rail.

The blank is 1 to 2 inches shorter than the finished spike, because in the next operation when the threads are rolled on it the spike is elongated. It will be noted in the illustration that the outside diameter of the screw spike's threads is practically the same as that portion under the collar—the original rod diameter. The surplus material, therefore, can be forced only one way, lengthwise and out.

The blanking machine turns out screw spike blanks at about the same speed with which standard square-sided spikes are made complete, varying with size; but the additional threading operation is slightly slower, per unit.

Some of the screw spikes are made with so-called pilots, or smooth round ends, to be inserted in a hole drilled in the tie preliminary to screwing it against the rail.

Some unusual types of spikes have been developed and tried from time to time. One of these has a square shank, the same as the standard railroad spike, but has barbs closely spaced, longitudinally, on all sides along its length. These do not obstruct the driving of the spike, but are intended to make loosening difficult—on the principle of the fish hook.



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IMPROVING OPEN-HEARTH FURNACE DESIGN

BY WILLIAM C. BUELL JR.

Part IV—Mechanics of the Roof

(Eighteenth Article of Series)

IN ORDER to have assurance of ample toe protection it is the author's practice to establish a basing point, *BP*, 6 inches above the top of the front or back wall and 9 inches in from the outer surface of the furnace brickwork. A line representing the angled face and equalling $\frac{\theta}{2}$ is drawn through *BP* and continued downward in length to about equal the radius, *rad*.

As will be seen, the tentative span of this roof will be the width of the furnace outside of the brickwork minus 18 inches (9 + 9 inches). If $\theta = 60$ degrees then the span and the radius will be the same; otherwise, the length of the radius with reference to the span (or chord) may be determined by the use of the factors of Table XXXIX, column b. If a roof similar to that of Fig. 31 is to be used, a radius, based on the span at the basing points, is the normal radius for the roof. If, however, the older type of roof is to be used, a new radius 4½ inches less than the radius developed on the basing points is the normal radius. The length of the face of the skewback brick above the basing point is, of course, appropriate to the depth of the roof brick used. The skewback brick now may be developed completely, bearing in mind the skewback thickness, *t*, and that shown in Fig. 35, is typical. While the chief advantage of this method of design is the assurance of a skewback brick of maximum side area, the removal of the necessity for the notation or use of the fractional dimensions for the height, *T*, and width *D* of the toe, the length of the back, *H* and the width of the top, *S*, considerably simplifies manufacture and check. The thickness, *W*, of the skewback brick can be as desired, but good practice in manufacture and construction would appear to indicate 3 inches as satisfactory. The skewback brick must be manufactured carefully and accurately of the best materials and skillfully fitted and laid in place in order that maximum roof life be secured.

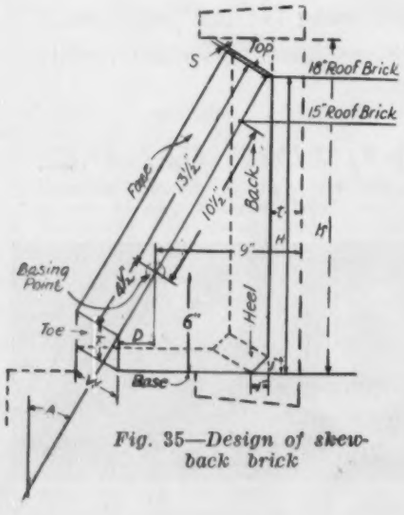


Fig. 35—Design of skewback brick

Inside Height Important

The interior height, *h*, of the skewback should be such that the inner end of the top flange be free from interference with the roof brick, while the thickness, *t*, must be sufficient to develop the required strength.

The method of the design of the skewback brick in furnaces having an angled roof chord as with the sloping back wall is in all respects similar to that just described. Such an arrangement is shown in Fig. 36. The angularity of the faces of the skewback bricks of the front and back wall are dissimilar but otherwise the procedure of design is the same as for that previously described. Loose brick, *LB*, are indicated in connection with the skew systems of both Figs. 34 and 36. As the designation implies, they are loose brick laid on top of the walls after the roof is in place. If the spaces at their back and top are filled with chrome ore a considerable measure of protection to the toe of the skewback brick is added.

Steel Is Suitable

Steel which may be the rolled product of the mill or the cast product of the foundry is the only material suitable for skewbacks or skew channels. The cast product is the more suitable for service about the furnace laboratory on account of its greater ability to withstand temporary excessive temperatures with a much smaller degree of permanent distortion from such a cause than the rolled material. If a section of a roof near the front or back wall collapses, and there is an ever-present possibility of this happening, the skewback may be subjected to high-temperature radiant heat from the bath or even direct flame for an appreciable priod of time. Under such a condition a considerable warpage of a rolled-steel section may occur in a short time and while the cast-steel section will warp under similar conditions a much greater time will be necessary to produce the equivalent warpage of the rolled section. In spite of the fact that the cast-steel skewback will be more expensive in first cost than the rolled-steel member, it is thought that the use of the cast-steel section gives the assurance of a longer roof life and ultimately is much the cheaper.

Examination of Fig. 21 will disclose that with regards to the front wall, six of the furnaces employ cast-steel skewbacks and the others have rolled members, either 15 or 18-inch channels. At the back wall, five furnaces show cast-steel skewbacks, eight have rolled members, 15 or 18-inch channels or I-beams, while one, furnace G, has the entire skew system de-

Table XLIV

Data on Skewback Spans

Furnace	Center to center of buck-stays, ft.—in.	Width over buck-stays, inches	Clear span of skewback, ft.—in.
A	8— 1	27	5—10
B	7— 3	28	4—11
C	8— 4	28	6— 0
D	7—11¼	28	5— 7¼
E	8— 0	30	5— 6
F	11— 6	54	7— 0
G	8— 3	28	5—11
H	7— 7½	28	5— 3½
I	8— 9	30	6— 3
J	8— 2½	35	5— 3½
K	9— 0	35	6— 1
L	8— 2	28	5—10
M	7—11¼	28	5— 7¼
N	8— 1	27	5—10
O	8— 4	27	6— 1
Ideal	8— 9	31	6— 2

veloped from plate which is maintained by water cooling.

A water cooling pipe is present in the back wall of furnace B located just under the lower flange of the channel. No reinforcing of the skewbacks at the front of a furnace is possible. On account of the introduction of the door frames and the movement of the doors, the exposed surface of the skewbacks must present a plane surface in line with the interior faces of the buckstays. Reinforcing of the skewbacks at the back walls, however, is feasible; Fig. 21 shows it to be employed in connection with furnaces D, E, and M. Others, not shown, probably are reinforced.

Stresses to which skewbacks are subjected depend upon the type of design and the weight of the roof, its radius and rise and particularly on the distance between the side faces of the buckstays which is the clear span in which the maximum moments are developed. Because of the distance the skewback is required to span, it is of a major importance that such a span be developed for use in consideration of the total loading of that member.

The data on this subject as found in existing furnaces are given in Table XLIV and are taken from Fig. 17. The data for the ideal furnace based on the tabular data are noted as the final item.

Skewback Span Varies

Omitting furnace F, an exceptional development and, therefore, not typical, it will be seen the clear distances the skewbacks are required to span vary within 4 feet 11 inches to 6 feet 3 inches. Door width is, of course, the principal factor in the establishment of this dimension. For the purpose of demonstration a clear span of 6 feet 2 inches is assumed.

In the discussion of the statistics of the roof, methods of determining the horizontal, *HF*, and vertically downward, *DF*, stresses separately were devloped. The horizontal force so found represents the total loading of the skewback in this direction, but the downward force is but one of several items that constitute the total loading of the skewback vertically. The most advanced type of skewback design, later discussed, is arranged so that it takes the entire weight of the roof; consequently, the total vertical loading is the summation of the static force, the weights of the roof, skewback brick, and the skewback and its supports.

For the purpose of developing the maxima and minima of these various factors that enter into skewback design, typical values have been developed, Table XLV, in which all data necessary for the design of certain enumerated skewbacks are included.

A 100-ton furnace, with a roof chord of 17 feet 9 inches and a roof having

Table XLV

Required Data for Skewback Design of Selected Roofs

General Data	Item	100 Ton Front	100 Ton Back	150 Ton Front	150 Ton Back	350 Ton Front	350 Ton Back
Furnace rating	a						
Position of skewback	b	Front	Back	Front	Back	Front	Back
Length of roof chord, (*C*), ft.-in.	c	17—9		19—9		25—9	
Roof rise, (*R*), feet	d	1.696	3.170	1.91	3.53	2.462	4.602
m (front) or n (back), feet	e	7.5	10.25	8.34	11.41	10.875	14.875
Type of roof	f	Z A		Z E		Z E	
Unit weight, pounds	g	3,315	4,535	5,780	7,920	7,550	10,350
Unit reaction, (*F*), pounds	h	8,875	9,650	14,100	15,560	19,900	18,120
Data on Horizontal Loading		Axis *y-y* of channel section					
Unit horizontal thrust, (*HF*), pounds	i	7,930		12,800		16,370	
Total loading of skewback, pounds	j	23,150		37,300		47,750	
Maximum moment, inch-pounds	k	125,200		205,000		256,800	
S @ 7000 pounds	l	17.89		29.30		36.69	
S @ 9000 pounds	m	13.91		22.80		28.53	
Data on Vertical Loading		Axis *x-x* of channel section					
Unit vertical thrust, pounds	n	3,398	4,515	6,065	8,865	7,200	9,340
Unit weight, pounds	o	3,315	4,535	5,780	7,920	7,550	10,350
Weight skewback brick, pounds	p	135	135	204	204	204	204
Weight of skewback, pounds	q	429	474	474	474	639	759
Unit loading, pounds	r	7,277	9,659	12,523	17,463	15,593	20,653
Total loading of skewback, pounds	s	21,220	28,160	36,500	50,950	45,450	60,250
Maximum moment, inch-pounds	t	140,500	186,500	241,800	337,500	302,000	399,500
S @ 7000 pounds	u	20.07	26.44	34.54	48.20	43.14	59.07
S @ 9000 pounds	v	15.61	20.72	26.87	37.50	33.55	44.39

the characteristics of ZA is included as representing minimum values, while a 350-ton furnace having a chord of 25 feet 9 inches and a roof ZE is included to represent what will be a maximum for some time to come. In addition parallel data on the ideal roof for the 150-ton furnace are included.

Values common to all of these roofs (for symbols refer to Fig. 30) follow: $\theta = 60$ degrees, $\gamma = 4$ degrees 40 minutes, α and $\Delta_1 = 25$ degrees 20 minutes, β and $\Delta_2 = 34$ degrees 40 minutes.

The 60 degree roof was selected as representing virtually the most severe condition of loading. While a lesser included angle would increase all stress values somewhat, it is not thought in view of these analyses that roofs flatter than 60 degrees will be used. Further if roofs with the angle greater than 60 degrees are designed, horizontal stresses are eased considerably. The explanation to follow will clarify the derivation of certain items whose meaning might be obscure.

(*To be continued*)

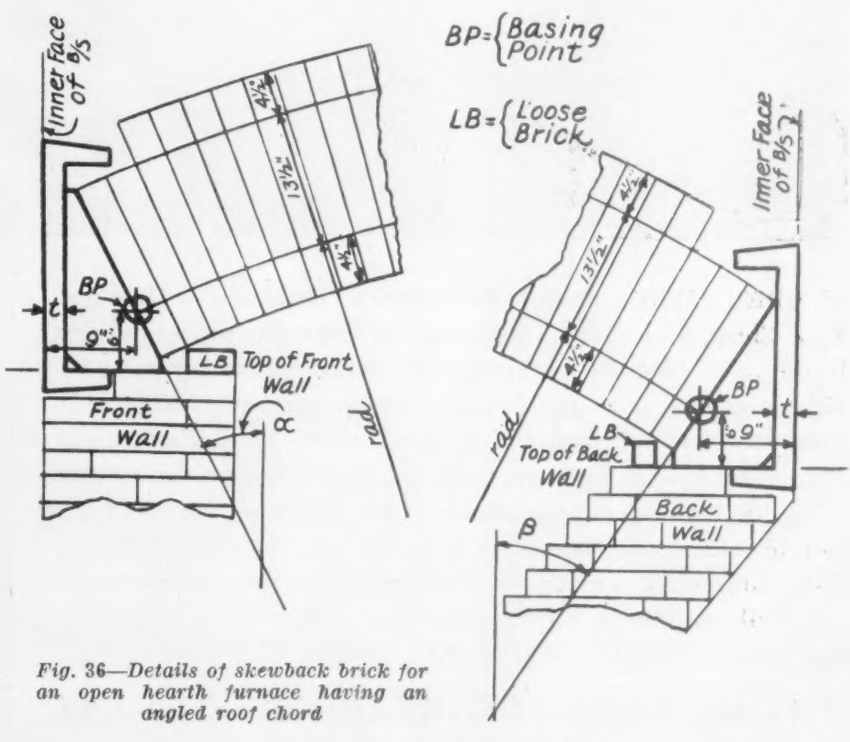
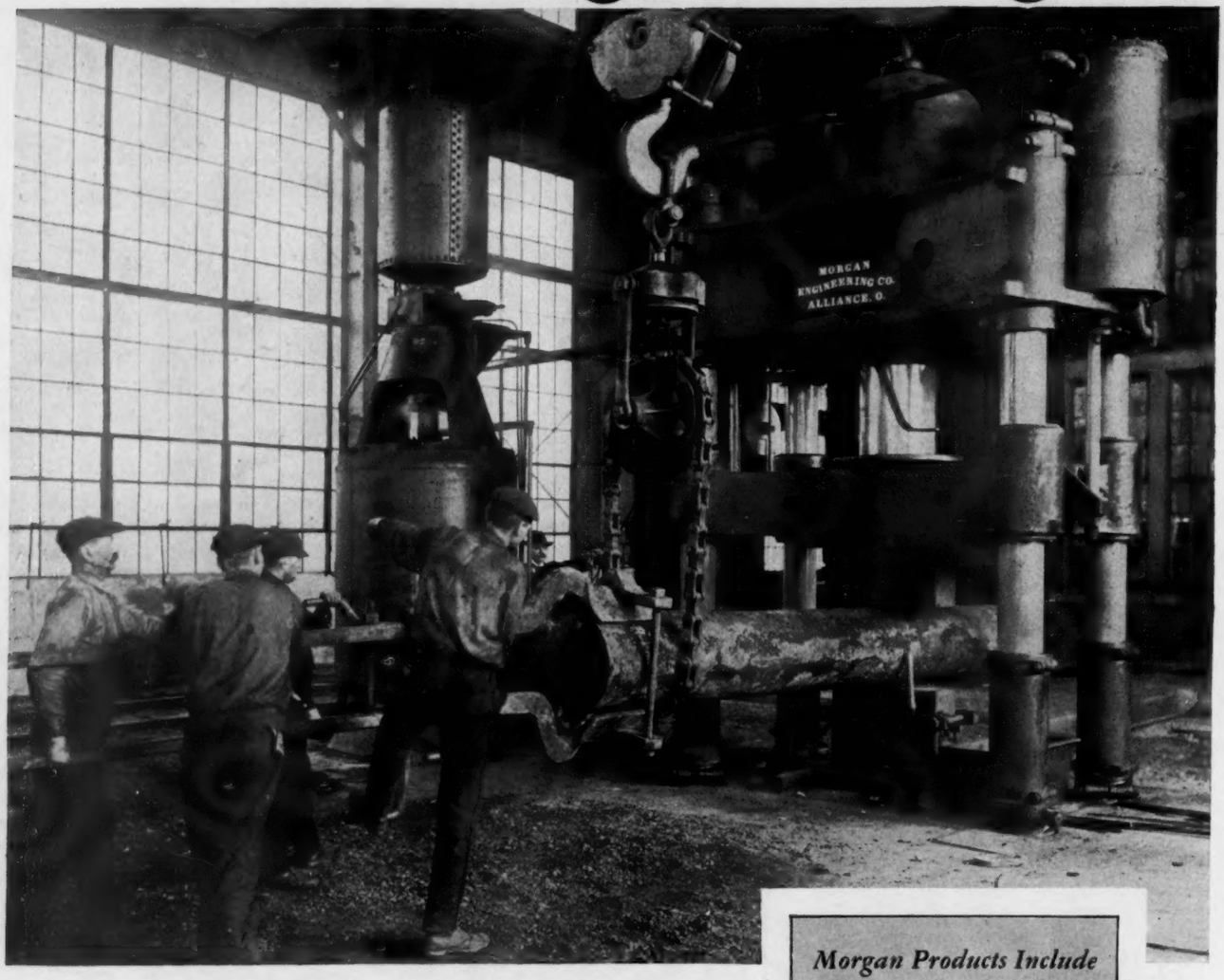


Fig. 36—Details of skewback brick for an open hearth furnace having an angled roof chord

BUILT BY MORGAN *Engineering* » »



ORIGINALLY known in the American Ruhr as The Hammer Shop, The Morgan Engineering Company pioneered the building of steam hammers for the forging industry in 1868. Keeping pace with the industry's requirements, Morgan in later years has built many high speed steam Hydraulic Forging Presses for producing heavy forgings. An 800-ton press is shown here, having a maximum stroke of 40″, working stroke of 5″. Single frame types are built from 150 to 500 tons capacity; four column types up to 6000 tons capacity. Forging Hammers are built in 150 to 40000 pounds capacity; Drop Hammers are built in 1000 to 16000 pounds capacity.

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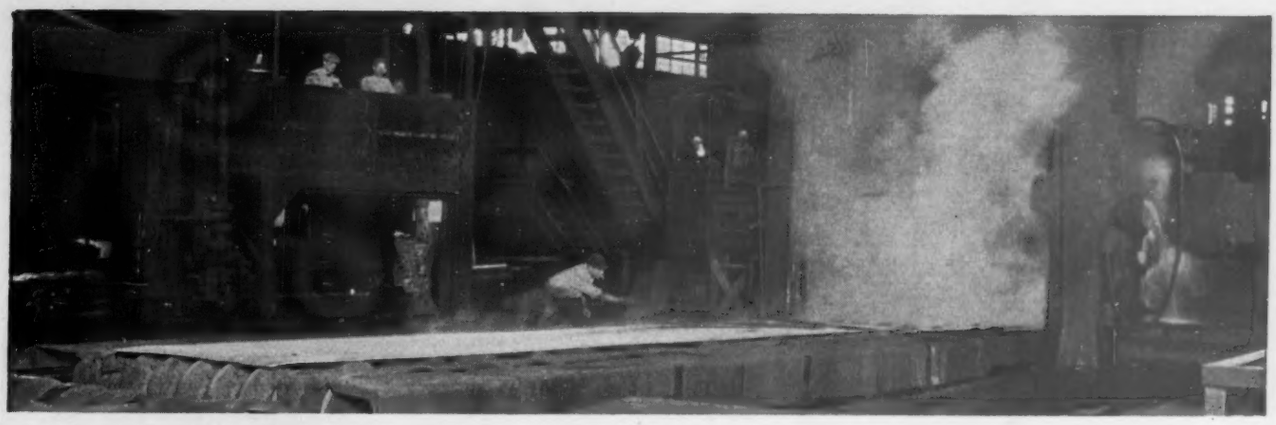
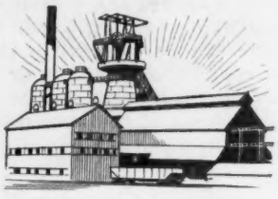


PROGRESS IN STEELMAKING

INSTALLATION of 3-pass checkers on an Isley-type open-hearth furnace in the Pittsburgh district has afforded an increase of 250 degrees Fahr. in the checker temperatures, less clogging in the first pass and no clogging in the second and third passes, compared with former practice. Over 200 heats have been taken off without any replacement of brick.

♦ ♦ ♦

Maintaining given loads over long periods and permitting testing at a constant rate of strain are the purposes attained by a new automatic control designed for testing machines which are operated hydraulically.



REDUCED wind and "fanning" in blast furnace practice, which has been a development necessitated by curtailing production of pig iron without blowing out the blast furnace, is arousing discussion among refractory brick experts, many of whom claim that a return to normal blast will compel complete relining of the stack.

♦ ♦ ♦

Recent recommendation for the protection of steel water tanks, standpipes, gasometers, ore bridges, transfer cars, ore unloaders and other structural material exposed to the elements at by-product coke ovens, blast furnaces and steel plants consists in the application of a quick-drying red lead paint. The coating is composed of 100 pounds of red lead in oil, 1½ gallons boiled linseed oil, 3 pints of turpentine and 2 pints of liquid dryer. Two pounds of finely-powdered litharge is added to each gallon of the paint immediately before application. One week must elapse between the application of the priming and the second coats and 48 hours between the second and third coats.

♦ ♦ ♦

Development of a new type welding rod makes possible the design of pickling racks of forged or rolled monel metal with welded joints. Heretofore rapid deterioration of welds in pickling racks prevented this method of joining but with the use of the new rod welds are produced which are galvanically neutral to the parent metal in the presence of pickling acids. Racks of equal carrying capacity but lighter in weight now can be built.

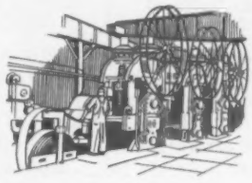
♦ ♦ ♦

Diffusion combustion in which a gas blanket is utilized to produce work free from scale has greatly improved press forging practice. Based on numerous test runs made by one large forging producer, forge furnaces equipped with diffusion combustion burners will afford a saving of 10 per cent in die expense and a 10 per cent saving in forging steel.

BLUE print development now is being accomplished by a new method. The printed paper following exposure is passed between a set of stainless steel rolls which are covered with a chemical solution. The surplus of the solution is removed from the paper as it passes through sprays of water. The prints then are dried. The use of potash is unnecessary. This process produces a deep rich blue from fast-printing papers and sharp line of demarcation between the blue and the white.

♦ ♦ ♦

Higher roll neck polish and lower costs of power and lubricants are claimed for continuous sleeve babbitted bearings now being installed on various mill units of a pipemaker in the Pittsburgh district, including a 32-inch blooming mill. Nearly 600,000 tons of pipe has been put through the company's sizing mill on the same set of complete sleeve bearings which still are in service.



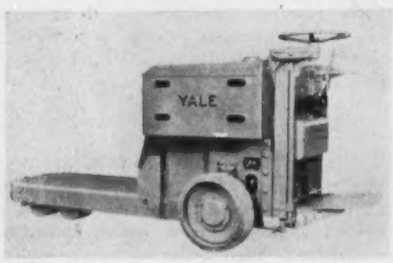
INTERRUPTIONS in cold strip rolling schedules to permit the end of tight hot-rolled coils to be fed into the gap of the rolls have been reduced to a small interval by the development of a magnetic uncoiling machine. In operation, a coil is placed on a set of horizontal carrier rolls between which a magnet is located. The coil is rotated until its outer end is directly over the magnet. With the end tightly held by the magnet, the carrier rolls move forward causing the coil to roll into a coil box and bend about 10 feet out of its curl. When the magnet is disengaged and the coil box rollers actuated, the end of the strip passes to a set of straightening rolls which feed it into the entry guides of the mill. This unit will feed stock to the rolls with the same small time interval between coils as the most efficient roller working ordinary widths on small mills.

NEW EQUIPMENT

PRODUCTION FABRICATION TREATMENT FINISHING

Low Lift Truck Embodies Safety Features

Yale & Towne Mfg. Co., Philadelphia, recently announced a new low lift truck with a rated capacity of 10,000 pounds. The unit, shown herewith, is provided with six wheels. Tandem rear wheel trailing axle, directly under the load platform, is hinged to the main frame members in such a way that a fore



Yale & Towne 10,000-pound capacity low lift truck

and aft compensating or rocking movement is possible providing equal load distribution when the truck is running over obstructions or grades.

Load platform is elevated to a height of 17 inches by a triple reduction spur gear power unit through sprockets and roller chains. An automatic cut-off switch limits the platform travel in either direction. Service brake is mounted directly on the motor end head opposite the driving pinion so that braking effort is distributed through the differential equally to both driving wheels. An important safety factor on this truck is the interlocking controller which is so arranged that the controller must always be returned to the neutral position and the brake released to obtain traveling power.

◆

Small Air Grinder Operates At High Speed

Madison-Kipp Corp., Madison, Wis., has placed on the market a new air grinder, small enough to be concealed in the palm of the hand, yet having a tested grinding speed of 40,000 revolutions per minute. The tool, shown on page 42, weighs only seven ounces. It has been developed to fill the need for a small, yet efficient air grinding tool for all light work and intermittent service.

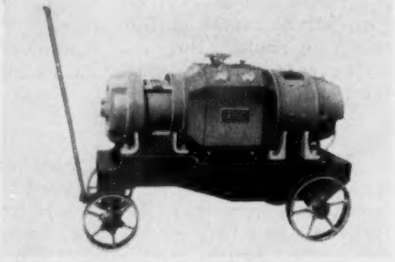
Before leaving the plant, every unit must prove itself able to hit the musical note of high F sharp. Through the method known as "tone testing," vibrations per minute are automatically transferred to revolutions per minute.

◆

Introduces Self-Excited Arc Welding Machine

Wilson Welder & Metals Co. Inc., North Bergen, N. J., recently developed a new four-bearing, self-excited arc welding machine designated model S. A. The unit, shown herewith, is built to meet the demand for high amperages and arc voltage required in speed and shielded arc welding. It offers the distinct advantage of a two-unit machine with a flexible coupling which permits the changing of the motor or the generator in case of failure.

No electrical contacts or connections are exposed. The only projecting parts are control handles and these are placed so that they are un-



Wilson model S. A. welding machine embodies improvements

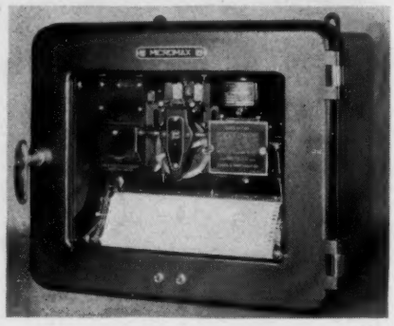
usually safe from injury. Moreover, the voltmeter and ammeter are set at an angle which appreciably reduces chances of damage. Although all parts are protected, this machine has perfect accessibility.

By means of a dual control system the voltage and amperage may be set independently and the instruments read with ease. The unit will weld at rated current in amperes, with 40 volts across arc, that is a high speed shielded arc.

◆

Designs All-Purpose Case for Standard Recorder

Leeds & Northrup Co., 4901 Stenton avenue, Philadelphia, has developed a new multi-purpose case for its Micromax recorder, shown in the



Leeds & Northrup standard recorder in multi-purpose case

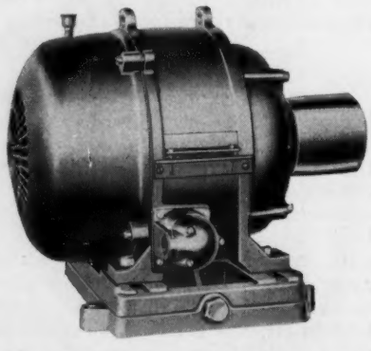
accompanying illustration. This sturdy unit is dust-tight and vapor-tight and can be supplied for mounting in any position as specified—either flush in panel, on front of panel or wall, or on table or bench. Case is sealed by turning the handle, thus pressing the door tightly against a rubber gasket.

Switches for motor, lights and control circuit are operable externally, and are vapor-proof, so that these units may be shut off before the door is opened and outside vapors reach the mechanism. Leads to the recorder can be brought in through either conduit connections or a pothead. The mechanism can be swung completely out of the case, so that it is accessible from all sides.

◆

Builds Line of Fan Seal Type Motors

Marble-Card Electric Co., Gladstone, Mich., has announced a new line of fan seal type motors in sizes ranging from 2 horsepower at 900 revolutions per minute to 30 horse-



Marble-Card fan seal type motor is self-cooling

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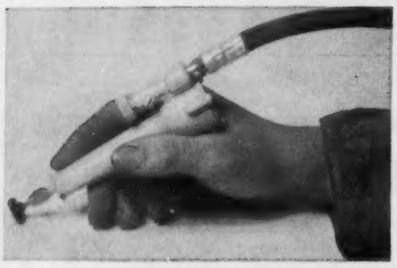


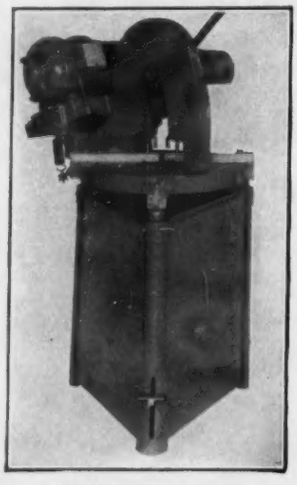
New Madison-Kipp high-speed air grinder weighs only seven ounces

power at 1800 revolutions per minute. The new type motor, shown herewith, is self cooling, self cleaning. Being entirely enclosed it is protected from dust, dampness and fumes. The fan sealed type eliminates danger of fires and explosions and the expense of special motor housings, boxings or ventilating systems. It may be operated in applications located out-of-doors.

◆

Cut-Off Machine Employs Abrasive Wheel

Tannewitz Works, Grand Rapids, Mich., has developed a new swivel table cut-off machine employing an abrasive wheel for the operation. The unit, shown in the accompanying illustration, may be employed for



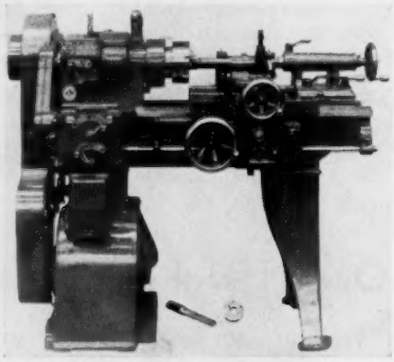
Tannewitz cut-off machine embodying swivel table

cutting-off metal molding, tubing, small bars, etc. The machine is made in two sizes; the smaller one taking motors up to 7½ horsepower, and the larger taking motors up to 15 horsepower. It is said that the main feature of the machine is that the circular table on which the motor and wheel yoke are mounted, swivels from 45 degrees left to 45 degrees right. That makes it unnecessary to swing the stock around to cut the angles. The machine is provided with hold-downs on both sides of the work, which are treadle operated. The cutter is depressed by a hand lever. The wheel spindle is driven by a multiple v-belt from a ball bearing motor. The spindle runs at approximately 5500 revolutions per minute which permits the abrasive wheels to cut through the metal stock practically instantaneously, smoothly and without leaving a burr.

◆

Develops New Elliptical Turning Lathe

R. K. LeBlond Machine Tool Co., Cincinnati, recently has developed an elliptical turning lathe suitable for



Elliptical turning lathe built by R. K. LeBlond Machine Tool Co.

turning punches and mandrels or for boring elliptical holes. A standard 11-inch geared head rapid production lathe was used as a basic machine. A splined shaft is geared to the spindle nose and is supported by the headstock and two brackets on the rear wing of the carriage. The carriage brackets are held rigidly in position and are spaced on opposite sides of the carriage bridge as shown in the illustration. Master cam is mounted between these brackets and is rotated by the splined shaft.

The roller which contacts this cam is mounted in a bracket in the center of the bottom slide. The bracket is cast integral to insure rigidity. It is located back of the cam so that the cam will pull the tool into the work. The cam follower is held in contact with the cam by two coil springs.

Since the form of the ellipse is determined by the contour of the master cam, any type of ellipse can be turned or bored merely by changing the cam. The construction also permits long parts to be turned.

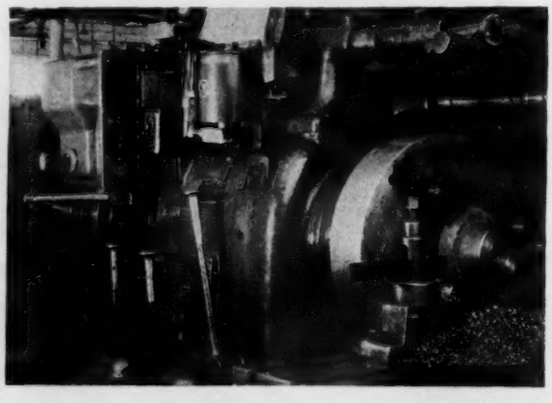
◆

Chuck Is Operated by An Electric Motor

Cushman Chuck Co., Hartford, Conn., recently developed an electric chuck to which an electric motor is applied for operation. The unit, shown below, has a wide application and may be used on any modern engine or turret lathe that is adaptable to pneumatic or hydraulic-operated chucks. Power consumption is low because the motor operates only with closing or releasing, the chuck. While machining is in progress no power is used for work holding purposes. Jaws are locked on the work at a predetermined pressure.

The motor and control have been developed by Westinghouse engineers, the former being of the high torque, squirrel-cage induction type and built into the chuck operating unit. The motor is balanced dynamically to reduce vibration when the lathe spindle is turning at high speed. When operating, the motor is allowed to gain full speed before it picks up the load and therefore delivers a hammer blow to a nut, causing it to release even when seized by stalling as in the case when the chuck grips a piece of work.

ELECTRIC chuck developed by Cushman Chuck Co., may be employed on any modern engine or turret lathe that is adaptable to pneumatic or hydraulic-operated chucks. Westinghouse engineers designed the motor and control, the motor being of the high torque, squirrel cage type



January Pig Iron Up 3.9%; Steel Rise Halts

Net Gain of 3 in Active Stacks, All Steel—Strikes Cut Automotive Releases—Terminal Puts Shape Awards Over 30,000 Tons—Exporting Scrap

PIG iron production increased 3.9 per cent in January, which ended with a net gain of three in the number of blast furnace stacks active. Daily output was 18,348 gross tons, compared with 17,650 tons in December, and the month's total 568,785 tons, against 547,179 tons in December.

A year ago, when the daily rate was 31,336 tons, production declined, the reverse of the current showing. Out of 291 potential stacks in the country, 45 were in blast on Jan. 31. January output represented 13 per cent of capacity, a rise of half a point over December.

The net gain of three in active stacks being entirely at steelworks, the steady improvement reported in steel production in January is confirmed. But in the past week the rising curve of steelmaking operations has flattened out and the average of 19 per cent attained in the week ended Jan. 28 was barely maintained in the week ended Feb. 4.

Chicago mills, laggards through January, expanded four points last week to 19 per cent; Youngstown rebounded five points to 20; Pittsburgh gained one point to 17. Cleveland, meanwhile, sagged three points to 38 per cent, eastern Pennsylvania two to 11, Birmingham ten to 20, and Buffalo six to 16.

The January rise had its origin in a rebound from the extreme low of the holidays, a slight gain in miscellaneous requirements, and automotive releases which on the whole slightly topped those of December.

In the past week, partly owing to the strike at Detroit, automotive demand slackened, and general needs ebbed. For many sellers, last week was as dull as the August low of the depression. This week, with Ford resuming, automotive releases will expand. Chevrolet has swelled its February program by 10,000 units.

For several weeks it has been the theory of producers that February would be quiet pending determination of the political situation and the placing of railroad business for spring. Another week may tell whether the break in the rise is a pause or indicates something deeper.

Plate and structural business has been outstanding the past few days. Cleveland reports inquiry for 400 beer tanks, requiring 4000 tons of plates; Chicago notes an encouraging growth in general demand; at Pittsburgh, 10 barges taking 1550 tons are active and Hoover dam work requires 3000 tons; 396 brewery tanks active at New York aggregate 3000 tons of plates.

Including 21,500 tons for the St. John's Park terminal in New York for the New York Central railroad, structural awards last week went to 30,846 tons, largest since the third week of December.

Raw materials continue more promising than finished products. Pig iron shipments in January expanded more rapidly than production, indicating some lessening of stocks. The call for scrap has been markedly heavier, and in the blast furnace grades a noticeable shortage is developing, with a consequent firming of prices. Indicative of this, the steelworks scrap composite of STEEL is up 4 cents to $6.29.

Export demand for scrap is higher. Italy, Danzig and Japan are current buyers, Japan ceasing to buy on the Pacific coast but taking cargoes out of Atlantic ports.

To unsettled prices is ascribed some blame for the withdrawal of finished steel buyers. Sheets, especially galvanized, continue soft, and the weakness in light cold-rolled sheets has carried cold-rolled strip down several dollars a ton. The recent break in wire products has not entirely clarified the situation; shading continues, and full extras for mixed carloads are not always charged. Heavy finished steel quotations are generally firm, but the sheet and wire adjustments have made some buyers cautious.

STEEL's iron and steel composite is off 19 cents this week to $28.35 and the finished steel composite is down 40 cents to $45.30.

Composite Market Averages

	Feb. 4	Jan. 28	One Month Ago Jan., 1933	Three Months Ago Nov., 1932	One Year Ago Feb., 1932	Ten Years Ago Feb., 1923
Iron and Steel Composite	$28.35	$28.54	$28.68	$29.12	$29.56	$42.61
Finished Steel Composite	45.30	45.70	46.13	47.20	46.72	61.60
Steelworks Scrap Composite	6.29	6.25	6.23	6.87	7.89	20.65

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate pipe. Steelworks Scrap Composite:—Melting steel, compressed sheets.

COMPARATIVE PRICES OF IRON, STEEL AND COKE

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	Feb. 4, 1933	Jan. 1933	Nov. 1932	Feb. 1932
Pig Iron				
Bessemer, del., Pittsburgh	$15.76	15.76	15.76	16.96
Basic, valley	14.00	14.00	14.00	15.00
Basic, eastern, del. eastern Pa.	13.50	13.50	13.50	16.00
No. 2 foundry, del. Pittsburgh	15.76	15.76	15.75	16.76
No. 2 foundry, Chicago	15.50	15.50	15.50	16.50
*Southern No. 2, Birmingham	11.00	11.00	11.00	11.00
**No. 2X, Virginia furnace	17.75	17.75	17.75	18.00
**No. 2X, Eastern, del., Phila.	13.76	13.76	13.95	15.76
Malleable, valley	14.50	14.50	14.50	15.50
Malleable, Chicago	15.50	15.50	15.50	16.50
Lake Superior charcoal, del. Chi.	23.04	23.04	23.04	23.04
Gray forge, del. Pittsburgh	15.63	15.63	15.63	16.33
Ferromanganese, del. Pittsburgh	73.24	73.24	73.24	80.24

*1.75-2.25 silicon. For local delivery. Northern shipments based on $10, Birmingham. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

Coke				
Connellsville, furnace, ovens	1.75	1.75	1.80	2.25
Connellsville, foundry, ovens	2.50	2.50	2.65	3.25
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	27.00
Wire rods, Pittsburgh	35.00	36.20	37.00	37.00

	Feb. 4, 1933	Jan. 1933	Nov. 1932	Feb. 1932
Finished Material				
Steel bars, Pittsburgh	1.60	1.60	1.60	1.50
Steel bars, Chicago	1.70	1.70	1.70	1.60
Steel bars, Philadelphia	1.91	1.91	1.91	1.81
Iron bars, Chicago	1.65	1.65	1.65	1.70
Shapes, Pittsburgh	1.60	1.60	1.60	1.50
Shapes, Philadelphia	1.65	1.70	1.75	1.62
Shapes, Chicago	1.70	1.70	1.70	1.60
Tank plates, Pittsburgh	1.60	1.60	1.60	1.50
Tank plates, Philadelphia	1.59½	1.66	1.77	1.69½
Tank plates, Chicago	1.70	1.70	1.70	1.60
Sheets, No. 10 blue anneal., Pitts.	1.60	1.65	1.70	1.70
Sheets, No. 24, hot ann., Pitts.	2.00	2.05	2.10	2.15
Sheets, No. 24 galvan., Pitts.	2.50	2.70	2.85	2.75
Sheets, No. 10 blue anneal., Chi.	1.85	1.85	1.85	1.90
Sheets, No. 24 hot ann., Chi.	2.15	2.25	2.25	2.35
Sheets, No. 24 galvan., Chi.	2.65	2.85	2.90	2.95
Plain wire, Pittsburgh	2.10	2.15	2.20	2.20
Wire nails, Pittsburgh	1.80	1.90	1.95	1.95
Tin plate, per base box, Pitts.	4.25	4.25	4.50	4.75
Scrap				
Heavy melting steel, Pitts.	$8.25	8.35	9.15	10.25
Heavy melting steel, eastern Pa.	6.50	6.50	7.25	7.35
Heavy melting steel, Chicago	5.25	5.25	5.60	6.80
No. 1 wrought, eastern Pa.	6.50	6.50	7.25	9.00
No. 1 wrought, Chicago	5.00	5.00	5.60	6.85
Rails for rolling, Chicago	7.75	8.05	8.25	9.85

Sheets

Automotive Shipments Slower, But Revival Is Expected Shortly—Prices Still in Easy Trend

SHEET PRICES, PAGE 45

Pittsburgh—The body plant shutdowns in Detroit have affected the sheet mills in this district relatively little, specifications from that city continuing light. January sheet bookings were about the same as December. Black sheets at 2.00c to 2.10c, heavy hot rolled at 1.45c to 1.55c, and heavy blue annealed at 1.60c to 1.70c were relatively unchanged during January, but galvanized at 2.50c to 2.60c is down from 2.85c at the beginning of the month and declines have affected both heavy and cold rolled sheets. No. 28 gage tin mill black is quoted 2.20c to 2.30c, the latter figure not having disappeared in recent sales.

New York—Sheet prices show additional declines, with galvanized now being offered generally at 2.50c, Pittsburgh, or 2.85c, New York. No. 10 hot rolled and No. 10 blue annealed at 1.45c and 1.60c, Pittsburgh, respectively, are being shaded $2 a ton to large buyers. No. 24 hot-rolled annealed sheets are moving at 1.95c to 2.00c, Pittsburgh, or 2.30c to 2.35c, New York. No. 10 heavy cold rolled are 1.80c to 1.85c, Pittsburgh, plus freight rate of 35.00c; and No. 20 cold-rolled usually are 2.30c, Pittsburgh. Buying continues light.

Philadelphia—Sheet prices generally declined further although the downward movement appears to be losing momentum. Efforts at stabilization appear to be having some effect. Sheet buying has continued to taper, consumers awaiting developments.

Cleveland—Automotive sheet releases have tapered and mill operations are slower. One northern Ohio mill working mainly on automotive account and recently at better than 35 per cent is down to 25 per cent, and easing is noted in other directions. A moderation is expected in February, with a resumption of heavier shipments in March. Labor trouble at the Briggs and Murray body units at Detroit is reported clearing up rapidly and further releases are anticipated shortly. Small, miscellaneous requirements show little variation from January. The Cleveland postoffice substructure will require 125 tons of galvanized. Protections are out from some mills at 2.50c, base, Pittsburgh, for galvanized and 2.10c for black, and though lower figures occasionally are encountered, more resistance is evident. Makers still are obtaining 2.30c for tin mill black, despite recent reports of concessions.

Cincinnati—Better demand from the general trade is maintaining sheet mill operations at about 30 per cent. Little booking is being done on future needs, partly because of price weakness.

Chicago—Sheet orders are fairly steady, and shipments have been aided by releases from the Ford Motor Co. Minor increases are reported in orders from some miscellaneous consumers, with automotive demand little changed. Prices continue easy on some grades of sheets, cold rolled material being lower. Galvanized sheets hold around 2.60c, base, with hot rolled annealed sheets usually 2.10c.

St. Louis—Producers and distributors note little change in requirements, except that seasonal quietness in galvanized is somewhat more pronounced than usual. Market opinion here is that a substantial improvement will develop in March.

Birmingham, Ala.—Sheet mill operations have slowed up, but this is believed to be temporary.

Harnischfeger Corp., Milwaukee, has received an order for 32 arc welders from the navy for use in shipbuilding operations at several naval stations.

CURRENT FINISHED STEEL PRICES

Delivered prices subject to freight surcharge corrected to nearest ½c. Asterisk denotes price change this week

Steel Sheets

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.45c to 1.55c
Gary, Ind. Harbor, base	1.55c to 1.65c
Chicago, delivered	1.60c to 1.70c
*New York, delivered	1.75c to 1.80c
*Birmingham, base	1.60c to 1.70c
*Philadelphia, delivered	1.71c to 1.76c

BLUE ANNEALED No. 9-10

Pittsburgh, base	1.60c to 1.70c
Chicago, district mills	1.70c to 1.80c
Chicago, delivered	1.75c to 1.85c
*Philadelphia, delivered	1.86c to 1.91c
*New York, delivered	1.90c to 1.95c
St. Louis, delivered	2.04c
*Birmingham, base	1.75c to 1.85c
San Francisco c.i.f.	2.32½c

HOT ROLLED ANNEALED No. 24

*Pittsburgh, base	2.00c to 2.10c
Gary, Ind. Harbor, base	2.10c to 2.20c
Chicago, delivered	2.15c to 2.25c
*New York, delivered	2.30c to 2.35c
*Philadelphia, delivered	2.26c to 2.31c
*Birmingham, base	2.15c to 2.25c
*St. Louis, delivered	2.34c to 2.44c
San Francisco, c.i.f.	2.85c
Detroit, delivered	2.28½c

GALVANIZED No. 24

Pittsburgh, base	2.50c to 2.60c
Gary, Ind. Harbor, base	2.60c to 2.70c
Chicago, delivered	2.65c to 2.75c
*Philadelphia, delivered	2.81c
*New York, delivered	2.85c
*Birmingham, base	2.70c to 2.80c
*St. Louis, delivered	2.84c to 2.94c
San Francisco, c.i.f.	3.50c

AUTOBODY No. 20

Pittsburgh, base	2.45c

FURNITURE

Pittsburgh, No. 10 heavy	2.40c to 2.50c
Pittsburgh, No. 20 light	2.90c to 3.00c

TIN MILL BLACK No. 28

*Pittsburgh, base	2.20c to 2.30c
*Gary, base	2.30c to 2.40c
*St. Louis, delivered	2.54c to 2.59c

HEAVY COLD ROLLED No. 10

Pittsburgh, base	1.90c
Gary, Ind. Harbor, base	2.00c to 2.10c
Chicago, delivered	2.05c to 2.15c
*Philadelphia, delivered	2.11c to 2.16c
*New York, delivered	2.15c to 2.20c

COLD ROLLED No. 20

Pittsburgh, base	2.30c
*Gary, Ind. Harbor, base	2.40c to 2.50c
*Chicago, delivered	2.45c to 2.55c
*Philadelphia, delivered	2.56c to 2.61c
*New York, delivered	2.65c

Wire Products

(Prices apply on straight carloads. Mixed and joint carloads take 10 cents higher price; pool carloads 25-cent advance; less carloads 40-cent advance.)

F.o.b. mills, 100 lb. keg

Standard wire nails	$1.80
Cement coated nails	1.80
Galvanized nails	3.30

(Per pound)

Polished staples	2.50c
Galvanized staples	2.75c
Barbed wire, gal.	2.30c
Annealed fence wire	2.25c
Galvanized wire	2.60c
Woven wire fencing (9-11 gage)	$50.00
(12½ gage and lighter)	$55.00

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.10c
Spring wire	3.10c

Chicago and Anderson, Ind., $1 over Pitts.-Cleve.; Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Steel Plates

Pittsburgh, base	1.60c
*New York, delivered	1.70c to 1.80c
*Philadelphia, del.	1.59½c to 1.69½c
Boston, delivered	1.82c to 2.02c
Buffalo, delivered	1.85½c
Chicago, base	1.70c
Cleveland, delivered	1.78½c
Birmingham, Ala. base	1.75c
*Coatesville, Pa., base	1.50c to 1.60c
Pacific Coast, c.i.f.	2.00c
St. Louis, delivered	1.94c

Structural Shapes

Pittsburgh, base	1.60c
Philadelphia, delivered	1.65c to 1.75c
New York, delivered	1.77c to 1.87c
Boston, delivered	1.90½c to 2.00½c
Chicago, base	1.70c
Cleveland, delivered	1.78½c
Lackawanna, N. Y., base	1.70c
Birmingham, Ala., base	1.75c
Pacific Coast, c.i.f.	2.10c
Do., wide flange	2.20c

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	1.70c
Birmingham, Ala., base	1.75c
Lackawanna, N. Y., base	1.70c
Pacific Coast, c.i.f.	2.00c
Cleveland, base	1.65c
Philadelphia, delivered	1.91c
New York, delivered	1.95c
Boston, delivered	2.02c
*Pittsburgh, cold finish	1.70c
*Pittsburgh, forg. qual	1.75c and 1.85c
San Francisco, c.i.f.	2.10c

RAIL STEEL

Chicago Heights	1.50c
*Eastern mills	1.30c to 1.35c

IRON

Chicago, base	1.60c to 1.65c
New York, delivered	1.85c to 1.90c
Philadelphia, delivered	1.81c to 1.86c
Pittsburgh, refined	2.70c to 4.20c

REINFORCING

Pitts. billet cut lengths	1.65c
Pitts., stock lengths mill	1.50c
Chicago, billet	1.50c to 1.60c
Chicago, rail steel	1.20c to 1.30c
Philadelphia, cut lengths	1.81c to 1.96c
Cleveland, cut lengths	1.75c

Cold-Finished Bars, Shafting

Base Pittsburgh for one size, shape and grade for shipment at one time to one destination

10,000 to 19,999 pounds	1.70c
20,000 to 59,999 pounds	1.65c
60,000 to 99,999 pounds	1.60c
100,000 pounds and over	1.57½c

Chicago, Cleveland, Buffalo 5c higher; Detroit, 20c; eastern Michigan 25c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel Sheets, 35c; plates, 31c; bars, 28c

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold Strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Tin and Terne Plate

Per 100-pound box, Pittsburgh

Tin plate, coke base, cont.	$4.25
Tin plate, coke base, stock	3.75
Long ternes, 24 unassorted	2.70c to 2.80c

Gary, Ind., base 10 cents higher

Alloy Steel

Hot rolled, f.o.b. Pittsburgh, Buffalo, Chicago and Massillon, O. Base, 2.45c to 2.65c. Differentials to various classes of consumers

S.A.E.	Alloy Diff.	4600 .20 to .30 Mo. 1.25-1.75 Ni.	1.05
2000	0.25	5100 .80 - 1.10	
2100	0.55	Cr.	0.45
2300	1.50	5100 Cr.	
2500	2.25	spring	0.20
3100	0.55	6100 bars	1.20
3200	1.35	6100 Spring	0.95
3300	3.30	Cr., Ni., Van.	1.50
3400	3.20	Carbon van	0.95
4100 .15 to .25 Mo.	0.50	9250 (flats)	0.25
		9250 (rds., sq.)	0.50

Strip, Hoops, Bands

Hot-rolled strip up to 23 15/16 in. wide Pitts.	1.45c
Do., Chicago	1.55c
Do., del. Philadelphia	1.76c
Do., del. New York	1.80c
Cooperage hoop, Pitts.	1.55c to 1.60c
Do., Chicago	1.65c to 1.70c
*Cold roll, strip, Pitts., Cleve.	1.80c to 2.00c
Worcester, 3 tons or over	2.20c

Rivets, Wrought Washers

Struc., c.l., Pitts-Cleve.	2.25c
Struc., c.l., Chicago	2.35c
*7/16-in. and smaller, Pitts., Chicago, Cleveland	70, 10 and 10 off
Washers, c.l., Pitts. dist.	6.50 to 6.75 off
Do., Chicago district	7.00 to 6.75 off

Rails, Track Material

Standard rails, mill	$40.00
Relaying rails, Pitts., 20 to 45 lbs.	$21.00 to 23.00
50 to 75	18.00 to 20.00
80 to 100	23.00 to 25.00
Light rails, 25-45, mills	$30.00
Light rails, Chicago	$32.00
Angle bars, mills	2.55c
Spikes, railroad, mills	2.40c
Spikes, boat, barge, Pitts.	2.65c
Track bolts, Chicago	3.50c
do., standard, jobbers	73 off list
Tie plates, Pittsburgh	$35.00
Tie plates, Chicago	$35.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots apply to Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread ..... 75 off
Rolled thread ½ x 6 and smaller take lower list.
Eagle list ..... 75 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 75 off
Tire bolts ..... 60 and 10 off
Stove bolts, 77½, 25 and 10 off in pkgs.; 86 off in bulk.
Rolled thread machine bolts, ½ x 6 and smaller take lower list.

NUTS

Semifinished ..... 75 off

HEXAGON CAP SCREWS

Milled ..... 80-25 off
Upset 1 in. diam. and smaller 80-25-10 off

SQUARE HEAD SET SCREWS

Upset, 1 in. and smaller ..... 75-10-10 off
Headless set screws ..... 75-10 off
Upset, larger than 1 in. ..... 75-10 off

Cut Nails, Piling

Cut nails, c.l. Pittsburgh	$2.50
Do., less carloads, 5 kegs or over	$2.90
Less than 5 kegs	$3.05
Steel sheet piling, Pitts.	1.90c

Bars

Chicago Mills Meet Largest Buying of Year—Alloy Bars Are More Active at Pittsburgh

BAR PRICES, PAGE 45

Chicago—Bar orders have attained their best activity of the year to date, both as to tonnage and number of purchases. Buying is well diversified with automotive requirements still leading. Recent improvement has been confined principally to the number of specifications, individual tonnages continuing light. Automotive demand is expected to maintain its recent rate for a short time, with additional improvement in miscellaneous specifications in prospect. Soft steel bars continue 1.70c, Chicago. Rail steel holds at 1.50c, with bar iron 1.60c.

New York—Despite weakness in certain other finished steel products, commercial steel bars are unchanged at 1.60c, Pittsburgh, or 1.95c, New York. With railroads and bolt and nut manufacturers specifying lightly, the movement of steel bars continues slow. Common iron bars are quiet at 1.50c to 1.55c, Pittsburgh, or 1.85c to 1.90c, New York.

Philadelphia — Commercial steel bars appear relatively steady at 1.60c, Pittsburgh, or 1.91c, Philadelphia. Apart from 700 tons for the ferry boat of the Virginia Ferry Corp., on which new bids are being asked, little outstanding business is pending. Common iron bars are 1.50c to 1.55c, Pittsburgh, or 1.81c to 1.86c, Philadelphia.

Pittsburgh—Merchant bars underwent a minor decline in demand during January compared with December. There has been no change in bar prices and 1.60c, Pittsburgh, is considered the market on soft steel bars with alloy 2.45c and occasionally 2.65c, mill.

Cleveland — Though January brought out a larger aggregate tonnage of commercial steel bars than December, the market was quieter last week. Bar shipments to the automotive manufacturers have fallen off, which some makers believe to be a temporary development. Current orders are comprised of small lots, moving at 1.65c, base, Cleveland.

Tin Plate Rate Declines; Specifications Slow

Tin Plate Prices, Page 45

Pittsburgh—Tin mill operations declined about 5 points last week to 40 per cent, average. This week there is likely to be a further slight reduction. Canmakers' specifications are slow. Many users may go through the year without contracting, and specifications will be difficult to anticipate. The Yorkville, O., tin mill commenced capacity operations Feb. 1, but the Steubenvile, O., tin plate producer is scheduled to close this week after five weeks of production. There is no deviation from the price of $4.25 per base box.

Cold-Finished Shows No Increase in Demand

Cold Finished Prices, Page 45

Pittsburgh — Cold-finished steel specifications late in January, for early February shipment, showed little change from early in the month, and in fact were less than in the same period in December. Little improvement is forecast for early February as far as can be ascertained. Price of 1.70c, Pittsburgh, continues base for 5 to 10-ton lots.

Plates

Tank Work Is More Active at Chicago—3000 Tons Pending For Hoover Dam Cylinder Gates

PLATE PRICES, PAGE 45

New York—More than 3000 tons of plates will be required for 396 tanks, construction of which is contemplated by breweries in this district. The Treadwell Engineering Co., New York, has booked 48 tanks for a Bronx brewery, taking 400 tons. Better buying of firebox steel by railroads is noted. Tonnage for cracking tanks also has improved. January plate business for one seller here was the best in six months. Carlots are moving at 1.50c to 1.60c, base, Coatesville, Pa., with concessions on attractive orders.

Boston—The wide spread in plate prices continues, with one or two eastern mills which are attempting to sustain the market at 1.70c, Coatesville, Pa., forced frequently to meet lower quotations by other eastern competitors. As a result, prices range up from 1.50c. Ship repair work is slightly heavier. Plans are nearing completion for two destroyers to be built at the Boston navy yard, taking more than 1000 tons of plates.

Philadelphia—Plates in carlots are moving generally at 1.50c to 1.60c, Coatesville, or 1.59½c to 1.69½c, delivered here. The 700 tons for the Virginia Ferry Corp. continues the largest tonnage pending.

Pittsburgh—Decision to buy ten 175-foot coal barges, requiring 1550 tons of plates and shapes, was revived by the West Kentucky Coal Co. late last week and barge builders have again entered bids. Several hundred tons of plates will be bid to the St. Paul engineers for two oil barges 110 x 24 x 5 feet, plans for which are being prepared. Tank builders are taking little material, Westinghouse Electric & Mfg. Co. will require about 3000 tons of plates and other steel products for eight cylinders, each 32 feet in diameter and 8 feet high, for the Hoover dam. Plain material remains 1.60c, Pittsburgh.

Cleveland—A firm planning national distribution of beer has issued a tentative inquiry for 400 tanks, 12 feet in diameter, requiring approximately 4000 tons of plates, the only brewery tank inquiry received here since the display of interest late last fall. Current demand from fabricators is restricted to small lots, though the aggregate shows a tendency to improve. The local plate mills will be on again this week. The price generally is 1.60c, base, Pittsburgh.

Chicago—Tank inquiry is increasing steadily, with further gains in future prospect. Tank orders from oil companies recently involve about 1000 tons. Phillips Petroleum Co., Bartlesville, Okla., has awarded 600 tons for tanks to be built in that state. Plate fabricators look for a fairly good business in oil barges.

Contracts Placed

3000 tons, cylindrically welded steel gates containing eight cylinders each 32 feet in diameter, 8 feet high and weighing 375 tons, for the Hoover dam, to Westinghouse Electric & Mfg. Co.; fabricating to be done at East Pittsburgh, Pa.

600 tons, tanks for Phillips Petroleum Co., Bartlesville, Okla., to Graver Tank & Mfg. Corp., East Chicago, Ill.

350 tons, large buoys, lighthouse bureau, Staten Island, N. Y., to Biggs

Boiler Works Co., Akron, O.
300 tons, tanks, Freeport-Texas Sulphur Co., Harvey, La., to Chicago Bridge & Iron Works, Chicago.
125 tons, tank and tower, Quincy, Fla., to R. D. Cole Mfg. Co., Newman, Ga.
100 tons, or more, storage tanks, Coastal Petroleum Co., Blakely Island, Ala., to Chicago Bridge & Iron Works, Chicago.
Unstated tonnage, 150,000-gallon steel tank and tower, naval air station, Corry field, Pensacola, Fla., to R. D. Cole Mfg. Co., Newman, Ga.; Burford, Hall & Smith, Atlanta, Ga., general contractors.
Unstated tonnage, elevated water tank, Carlyle, Ill., to Chicago Bridge & Iron Works, Chicago.

Contracts Pending

1550 tons, ten 175-foot coal barges for West Kentucky Coal Co., Sturgis, Ky.; inquiry for bids revived.
400 tons, two oil barges, 110 x 24 x 5 feet, for St. Paul engineers.
200 tons, tank, Carthage, Mo.; bids Feb. 16.

Railroads

Roads Delay Placing Rails and Fastenings Specifications Slow, Hampering Mill Output

TRACK MATERIAL PRICES, PAGE 45

Pittsburgh—No important inquiry for rails, fastenings or other railroad steel products has come into the market the past week and there has been considerable hesitancy on the part of some roads in closing on some material they have clearly indicated they need and will buy during first quarter. This hesitation has delayed operations at the Braddock rail mill, which now does not expect a scheduled rolling until possibly the second quarter. An inquiry for 700 kegs of spikes from the Erie railroad is active. No disposition has been heard of the 5000 kegs which the Pennsylvania railroad will distribute for eastern delivery. The price on spikes remains quoted 2.40c, mill, with tie plates $35 per ton and standard open-hearth rails $40.

New York—A fair tonnage of track repair material is expected to come out in the East within the next 60 days. Car and locomotive buying is entirely absent.

Cleveland—Railroads here have not yet formulated their rail purchasing programs, though some developments are expected this month. In the meantime, sales are restricted to small, miscellaneous repair requirements.

Chicago—Relatively good releases against orders for track material are noted in a dull market. While new buying is lacking, some roads are considering programs and some new purchases are looked for. Demand for various types of railroad equipment, however, generally is being deferred. Rail production has been maintained by small releases but is unlikely to be increased materially without further buying. Pacific Fruit Express has closed on its inquiry for 150 to 300 car underframes, each involving 5 tons, with a western interest. The hearing on the petition of railroads for an extension of the freight surcharge before the interstate commerce commission was opened here the past week.

Car Orders Placed

Pacific Fruit Express, 150 freight car underframes, to Pacific Car & Equipment Co., San Francisco.

Warehouse Prices Show Weakness in Dull Trade

Warehouse Prices, Page 63

New York—Most steel warehouses note little gain in January volume over December. Prices on galvanized and black sheets, recently reduced, are still unsettled, and, while untested, other light products are weak.

Boston—Steel jobbers have not revised prices on sheets, although prices on galvanized and black sheets continue mixed. Most warehouses are quoting 6.40c on No. 24 galvannealed sheets.

Philadelphia — Warehouse prices reflect weakness of the mill market but are unchanged. Trading continues quiet.

Buffalo—Continued slow demand for building steel is held accountable for slack warehouse business. January sales ran slightly behind those of December and the February outlook shows little improvement.

Cleveland—Warehouse business here in January, with orders improved in the latter part of the month came up to the December level. Demand is of a slow, routine character, with the price list unchanged.

Cincinnati—Jobbers here are marking time with few inquiries. Tonnage for January was about on a par with December. Prices are steady.

Detroit — Warehouse business in iron and steel products has declined slightly the past week, which is partly ascribed to the various shutdowns resulting from strikes and the closing of the Ford plant.

Pittsburgh—Jobbers in January booked the same, or less, tonnage than in December. Galvanized sheets remain 3.90c to 4.00c and black sheets 3.20c to 3.40c. Prices on all other products are unchanged.

Chicago—Sales are disappointing, January showing little change from December. Prices are unchanged despite recent decreases in some mill quotations.

St. Louis—The final week or ten days of January developed sagging tendencies in business of iron and steel warehouses. Purchasing by railroad shops and machine shops generally is in fair volume, but confined closely to items urgently needed.

Bolt, Nut Output Down; Small Rivets Are Lower

Bolt, Nut, Rivet Prices, Page 45

Chicago—Bolt, nut and rivet specifications continue slow, January sales for some interests being only about half the December volume. Shipments have been fairly steady, reducing backlogs. Automotive requirements are lighter, although shipments to jobbers and farm implement manufacturers recently have been slightly heavier. Small rivets have been reduced to 70, 10 and 10 off, compared with recent discounts of 70, 10 and 5. Large rivets are unchanged at 2.35c, Chicago, with bolts and nuts continuing 75 off.

Ferroalloy Shipments Heavier for January

Ferroalloy Prices, Page 54

Shipments of ferromanganese and spiegeleisen showed a fairly substantial increase during January, in keeping with the upturn in steelmaking operations. Foundries also have been active buyers as a result of the increased proportion of scrap in the melt. January shipments by some interests are reported three times as heavy as those of December. Leading sellers still are quoting $68, duty paid. Domestic spiegeleisen, 19 to 21 per cent, is $24, furnace, for spot shipment in the New York district. Recent figures point to the importation of about 8000 tons of foreign spiegeleisen throughout the country in 1932.

Structural Shapes

Award of 21,500 Tons for New York Warehouse Lifts Total Out of Low Rut—Action Pending on Large Tonnages, Including 28,000 for Southern California Project

STRUCTURAL SHAPE PRICES, PAGE 45

New York—For the New York Central railroad's St. John's terminal warehouse superstructure, 21,500 tons of shapes have just been awarded to American Bridge Co., Pittsburgh. This is the largest letting here since the Rockefeller Center project. Other current contracts are light, although a fair volume of pending requirements is bolstered by an estimated 12,000 tons for the postoffice annex superstructure, New York, on which bids close Feb. 28. Plain material is steady at 1.60c, Pittsburgh.

A large demand for sheet piling is expected to develop in the next few months as a result of heavy storms recently along the northeastern seaboard.

Cleveland—State bridge and road work is in abeyance pending discussion in the legislature on the proposal to divert all or part of the $30,000,000 gasoline and automobile license tax money available this year to charity. Builders are contending that more relief can be accomplished through construction and employment than by other means. Until the issue is decided, fabricators do not expect action on pending projects. The Willard Storage Battery Co. here has issued inquiries for a building requiring approximately 130 tons of structural material. The Austin Co., Cleveland, inquired for 250 to 300 tons for a structure for the United States Gypsum Co., at Midland, Calif., to be fabricated here, but is understood to have placed only a small order. Plain material is steady at 1.60c, base, Pittsburgh.

Harry C. Stalley, Cleveland, is low on field inspection of 11,200 tons of structural steel for the Cleveland postoffice, at 4.97c a ton.

Boston—Structural steel buying is light. Two Massachusetts state bridges are up, taking a total of 225 tons. Plain material prices are steady at 1.60c, Pittsburgh.

Philadelphia—Outstanding in the local structural market is the award of the general contract for the naval hospital here to John McShain, this city, a project requiring about 2800 tons of shapes and 700 tons of concrete bars. Standard shaps in carlots are moving generally at 1.60c, nearest mill, with wide flange sections at 1.70c.

Pittsburgh—Heavier structural inquiry came into the market last week when plans on 25,000 tons for five federal buildings in various districts came out for estimating. Mills report heavy hot-rolled specifications, mainly plain structural material, were slightly less in January than in December. Plain material is fairly firm at 1.60c, but fabricated prices are highly competitive.

San Francisco—Governor Rolph of California has signed the act validating an R. F. C. loan for $62,000,000 for the construction of San Francisco-Oakland bridge, requiring 117,000 tons of steel, as detailed in STEEL, Jan. 23, page 32.

Chicago—Shape awards continue light, while inquiry lacks improvement. The 1500-ton bridge at Justice Park, Ill., has been awarded after several months' delay. For a dam at Springfield, Ill., 455 tons of piling in addition to 550 tons of reinforcing bars have been ordered. Construction of Illinois highway bridges involving 500 tons on which bids were taken recently has been deferred.

Contracts Placed

21,500 tons, superstructure, warehouse, St. John's park terminal, New York, New York Central railroad, to American Bridge Co., Pittsburgh; James Sewart & Co. Inc., New York, general contractors.

4800 tons, federal building, San Fran- Wheeling Steel Corp., Wheeling, W. Co., Oklahoma City, general contractor.

1500 tons, bridge, Justice Park, Ill., to American Bridge Co., Pittsburgh.

1100 tons, temporary piling for lock No. 3, Allegheny river, to Jones & Laughlin Steel Corp., Pittsburgh.

950 tons, addition, postoffice, San Francisco, to McClintic-Marshall Corp., Bethlehem, Pa.; Lindgren & Swinerton, San Francisco, contractors.

750 tons, bridges and approaches, Granada and Holly, Colo., to McClintic-Marshall Corp., Bethlehem, Pa.; H. C. Lallier, Denver, general contractor.

611 tons, bridge over Colorado river, Mesa county, Colorado, to unnamed interest.

580 tons, Dan and Staunton river bridges, Virginia, to Wisconsin Bridge & Iron Co., Milwaukee.

500 tons, bridge, highway No. 2, McLennan county, Texas, to Virginia Bridge & Iron Co., Roanoke, Va.; through Brown-Abbott & E. L. Martin, contractors, Dallas, Tex.

500 tons, bridge, Jensen, Utah, to McClintic-Marshall Corp., Bethlehem, Pa.

455 tons, piling, dam, Springfield, Ill., to Inland Steel Co., Chicago.

450 tons, bridge, Iron Mountain, Mich., to Lackawanna Steel Construction Corp., Buffalo.

350 tons, bridges, Crawford and Randolph counties, Illinois, to Vincennes Steel Corp., Vincennes, Ind.

350 tons, postoffice, Beverly Hills, Calif., to McClintic-Marshall Corp., Bethletem, Pa.; Sarver & Zoss, Los Angeles, Calif., contractor.

310 tons, General Joe Wheeler lock and dam, Tennessee river, United States engineer, Chattanooga, Tenn., to Treadwell Engineering Co., Midland, Pa.; Stevens Bros. & Miller-Hutchinson Co., Florence, Ala., contractors. Truscon Steel Co., Youngstown, O., awarded 49 tons reinforcing bars.

275 tons, highway bridges, Randolph county, Illinois, to Wisconsin Bridge & Iron Co., Mliwaukee.

245 tons, five government bridges Whatcom county, Washington, to Pacific Car & Foundry Co., Seattle; Lindstrom & Feigenson, Portland, Oreg., general contractor.

205 tons, bridge, St. Lucie river, Martin county, Florida, to Virginia Bridge & Iron Co., Roanoke, Va.; W. S. Lochman Construction Co., West Palm Beach, Fla., contractor.

200 tons, kiln and furnace, United States Gypsum Co., New Brighton, Staten Island, N. Y., to Lackawanna Steel Construction Corp., Buffalo.

135 tons, building Alpha Portland Cement Co., Alsen, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.

125 tons, cable reel for Pacific Telephone & Telegraph Co., Seattle, and boiler for Oregon State penitentiary, to Washington Iron Works, Seattle.

120 tons, Panama, to John T. Hill, Baltimore, and Bethlehem Steel Export Corp., New York; bids Jan. 9. Central Iron & Steel Co., Harrisburg, Pa., awarded 75 tons of plates, same opening.

115 tons, postoffice, Clearwater, Fla., to Ingalls Iron Co., Birmingham, Ala.; Watt & Sinclair, Palm Beach, Fla., contractors.

100 tons, miscellaneous equipment jobs, to Pacific Car & Foundry Co., Seattle.

Unstated tonnage, repairing Rock Island railroad bridge over Illinois and Mississippi canal, lock 6 between Bureau and Tickilwa, Ill., to Wisconsin Bridge & Iron Co., Milwaukee, $11,365; fed-

Awards Compared

	Tons
Awards, week ended Feb. 4	30,846
Awards, week ended Jan. 28	6,995
Awards, week ended Jan. 21	11,332
Awards this week in 1932....	14,526
Av. weekly awards, 1932	14,285
Av. weekly awards, 1933.....	10,570
Av. weekly awards, Jan.....	8,143
Total awards to date, 1932..	90,447
Total awards to date, 1923....	63,421

eral engineer, Rock Island, Ill., project; bids Jan. 10.

Contracts Pending

28,000 tons, water and power development in southern California for Metropolitan Water District of Southern California commission, Los Angeles. Reconstruction Finance Corp. authorizes $22,800,000 loan. Project also requires 1090 tons of copper steel ground wire.

12,000 tons, superstructure, postoffice annex, midtown, New York; bids Feb. 28.

16,000 tons, Connecticut state highway bridge over Connecticut river at Hartford, Conn.; bids March 13.

10,000 tons, uptown postoffice, New York; bids Feb. 28.

5000 tons, superstructure St. Paul postoffice; bids Feb. 15.

4800 tons, Federal building, San Francisco; bids Feb. 28.

2800 tons, United States naval hospital, Philadelphia; John McShain, that city, awarded general contract.

2200 tons, including 400 tons permanent and 1800 tons temporary, steel sheet piling, Barren river dam, Kentucky.

2000 tons, postoffice, Nashville, Tenn.; bids Feb. 15.

750 tons, estimated, postoffice, San Diego, Calif.; bids March 15.

735 tons, ward, General hospital, San Francisco; bids postponed indefinitely.

670 tons, addition, Rochester, N. Y., state hospital; W. E. Wark Co., Albany, N. Y., low.

500 tons, shapes and bars, mess hall, school building, United States southwestern reformatory, El Reno, Okla.; bids Feb. 28.

450 tons, sheet piling, Deal, N. J.; Thomas Proctor, Long Beach, N. Y., low for general contract on new bids.

365 tons, state bridges, Monroe and Marion counties, Mississippi; bids Feb. 7.

350 tons, laundry building, Mt. Vernon, N. Y.

300 tons, postoffice, New London, Conn.; Central States Construction Co., University City, Mo., low.

300 tons, state building, Huntingdon, Pa.

300 tons, highway bridge, New Mexico.

265 tons, highway bridge, Baldwin, Ill.

260, No. 3 transit shed, district port commission, Albany, N. Y.

250 tons, piling, bulkhead, Chesapeake City, Md.; Trieste & Earle, Philadelphia, low on general contract.

250 tons, Walsenburg, Colo.

225 tons, state bridges, Oxford and Revere, Mass., former readvertised.

200 tons, highway bridge, Paducah, Ky.

200 tons, bridge, Erie railroad, Endicott, N. Y.

200 tons, building, F. G. Shattuck Co., Newark, N. J.

185 tons, state bridge, Hillsboro, N. H.

175 tons, vaults, treasury building, Washington; John W. Cowper Co., Buffalo, low.

150 tons, postoffice, Wausau, Wis.; bids March 1.

130 tons, building for Willard Storage Battery Co., Cleveland.

100 tons, eight monorail cranes and trolley beams, Sunnyvale, Calif.; Shaw Electric Crane Co., San Francisco, low.

100 tons, gates for government lock, Kaukauna, Wis.; bids Feb. 15 at Milwaukee.

Unstated tonnage, steel trusses, Camp Dix, N. J.; Frank M. Weaver & Co. Inc., Lansdale, Pa., low.

Concrete Bars

Eastern Markets More Active, With 5000 Tons Pending for Warehouse, and Road Work—January Specifications at Pittsburgh Down —Week's Awards Heavier

REINFORCING BAR PRICES, PAGE 45

New York—Several hundred tons of concrete bars and mesh for New York state highway construction have been placed. Building demands are heavier. The New York Central railroad's warehouse here will take 2250 tons. Federal and state work, the latter mainly hospitals, require an estimated 3000 tons. Billet bars and mesh prices are easy.

Boston—About 700 tons of bars have been placed for Connecticut highways. New inquiry is light. Both billet bar and mesh are weak. Rail steel bars also are easier.

Philadelphia—Inquiry is slightly better. John McShain, Philadelphia, has been awarded the general contract for the naval hospital here and will buy 700 tons of bars. Billet steel, in cut lengths, is holding at 1.50c to 1.65c, Pittsburgh, on carlots. Rail steel bars at 1.35c, eastern mill, are being shaded.

Pittsburgh—Specifications for concrete bars in January did not exceed those of December, according to mills in this district. Prospect for larger jobs for estimating this month appears remote in view of curtailment in federal and state appropriations. The reinforcing bar market is holding at 1.50c, Pittsburgh.

Cleveland—For the Cleveland postoffice 125 tons of concrete bars have been awarded to Truscon Steel Co., Youngstown, O., the largest order here during the week. The market is colorless, with public work in abeyance. Mill lengths of new billet steel bars are 1.40c to 1.50c, base, Cleveland.

Chicago—The largest recent concrete bar award is 550 tons for the Springfield, Ill., dam. Inquiries are slightly more numerous, practically all small lots.

Awards Compared

	Tons
Awards, week ended Feb. 4	**4,345**
Awards, week ended Jan. 28	**3,502**
Awards, week ended Jan. 21	**3,205**
Awards, this week, 1932	**2,795**
Av. weekly awards, 1932	**3,920**
Av. weekly awards, 1933	**3,623**
Av. weekly awards, Jan.	**4,348**
Total awards to date, 1932	**35,033**
Total awards to date, 1933	**21,738**

Contracts Placed

925 tons, bridge and highway No. 2, McLennan county, Texas, to American Steel & Wire Co., New York; through Brown-Abbott & E. L. Martin, contractors, Dallas, Tex.

550 tons, dam, Springfield, Ill., to Laclede Steel Co., St. Louis.

500 tons, mesh, state highway, Salem-Granville-Troy stage road section, Washington county, New York, to Wheeling Steel Corp., Wheeling, W. Va.; through Fitzgerald Bros. Construction Co.

365 tons, state highway work in San Bernardino county, Calif., to unnamed interest.

350 tons, armory, Binghamton, N. Y., and state school, Rome, N. Y., to Kalman Steel Corp., Bethlehem, Pa.

225 tons, mainly mesh, highway, Portsmouth, R. I., to American Steel & Wire Co., New York; through Callon Construction Co., Bristol, R. I.

150 tons, state school, Wassaic, N. Y., to Topper & Griggs, Hartford, Conn.; through Charles Smith & Sons Construction Co.

150 tons, postoffice, Oak Park, Ill., to Joseph T. Ryerson & Son Inc., Chicago; previously reported to Inland Steel Co.

150 tons, postoffice, Beverly Hills, Calif., to unnamed interest.

140 tons, state highway jobs in Klickitat, Okanogan and Whatcom counties, Washington, to unnamed interests.

125 tons, highway, New Canaan, Conn., to Wheeling Steel Corp., Wheeling, W. Va.; through D. Deering Co.

125 tons, highway, Suffolk county, New York, to Kalman Steel Corp., Bethlehem, Pa.

125 tons, postoffice, Cleveland, to Truscon Steel Co., Youngstown, O.

110 tons, state highway work, Orange county, Calif., to unnamed interest.

105 tons, United States engineer, Milwaukee, to Joseph T. Ryerson & Son Inc., Chicago.

100 tons, reservoir, Santa Maria, Calif., to unnamed interest.

100 tons, state bridge, Okemah, Okla., to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.; Boardman Co., Oklahoma City, general contractor.

100 tons, bridge approaches and highways, Granada and Holly, Colo., to Colorado Builders Supply Co., Denver; H. C. Lallier, Denver, general contractor.

100 tons, hospital, Rochester, N. Y., to Joseph T. Ryerson & Son Inc., Rochester; through McDonald-Spencer Engineering Co.

Contracts Pending

1200 tons, bars and expanded metal for

vaults in treasury building, Washington.

700 tons, United States naval hospital, Philadelphia; John McShain, that city, awarded general contract.

625 tons, state highways, Texas; bids Feb. 6.

500 tons, Federal building, San Francisco; bids Feb. 28.

400 tons, reinforced concrete and riprap superstructure, Pea Patch Island Dike, below New Castle, Del., federal engineer project; General Contracting Co., Camden, N. J., low, $98,586.

350 tons, addition, state hospital, Rochester, N. Y.; bids in.

250 tons, infantry batalion barracks, Plattsburg, N. Y.; J. A. Moraw & Owens Co., Chicago, awarded general contract, $206,916.

200 tons, alterations and additions, Walter Reed hospital, Washington; bids in.

200 tons, hospital, University of Maryland, Baltimore; Mullin Contracting Co., that city, low; bid is understood to have exceeded appropriation.

190 tons, state roadwork, Little River county, Arkansas; bids Jan. 31.

165 tons, service detachment barracks, West Point, N. Y.; bids Feb. 14.

130 tons, state bridges, Monroe county, Mississippi; bids Feb. 7.

100 tons, bridge, Oakland, Calif.; bids soon.

Low Bidders on Navy Tools

New York—Low bidders on equipment for the navy, covering the last two regular bid openings include: Williams, White & Co., Moline, Ill., rotary shaper, $5000, east delivery, $5200, west delivery; David H. Smith & Sons, Brooklyn, bending roll machine, $3950, east, and $4200, west delivery; Acme Machine Tool Co., Cincinnati, turret lathe, Puget Sound, $5450; three radial drills, Puget Sound, Kemp Machinery Co., Baltimore; Bardons & Oliver, Cleveland, lathe and equipment, Portsmouth, N. H.; Wickes Bros., Saginaw, Mich., engine lathe, Puget Sound, $11,059; Baldwin-Southwark Corp., Philadelphia, planer, Puget Sound, $30,040 and $30,980, f.o.b. works.

Climax Molybdenum Co., Climax, Colo., which recently increased its production, expects further expansion. Normally the company keeps 3,000,000 pounds in stock, but the past year stored only 850,000 pounds.

Pipe

Bookings at Pittsburgh Improve—South's Plants Busier—Chicago May Buy 8000 Tons

PIPE PRICES, PAGE 63

New York—United States Pipe & Foundry Co., Burlington, N. J., took about 1400 tons of cast pipe for Washington, but buying in the nearby New York territory is in small lots. Several thousand tons may come out for Hempstead and Pelham Heights, N. Y., depending on financing. Close to 1000 tons is active for miscellaneous state work, highways, hospitals and sewers. Prices are inclined to be more irregular.

Approximately 180 tons of 18-inch pipe is required for the New York Central's St. John's terminal development, for which James Stewart & Co., this city, are general contractors.

Boston—Bids are in on approximately 2115 tons of cast pipe and 55 tons of castings for Massachusetts state work, while 1200 tons for Boston are expected to be awarded to the low bidder, Warren Foundry & Pipe Co. Fair tonnages are being considered by New Britain, Hartford and Bristol, Conn., and Springfield, Mass. Prices are fairly firm.

Pittsburgh—Tubular products orders during January marked a slight gain over December, encouraging in view of the consecutive monthly decline for some time previously. Much of the business represents replenishment of jobbers' stocks though several large heating contracts and two line pipe jobs have been included in the total. Valley mill operations have improved recently.

Cleveland — Approximately 400 tons of 24-inch cast pipe will be required for a sanitary project at Cambridge, O., a loan for $25,000 being authorized by the R. F. C. Columbus, O., has placed 350 tons of cast pipe with a Chicago maker. Few public or private projects are maturing, and in the case of some subcontract awards requiring steel pipe and conduit placed several weeks ago buyers continue to shop for lower figures.

Chicago—Activity in cast iron pipe has yet to improve from its recent dull rate. Inquiries and orders are coming principally from small municipalities, few of the larger cities making any important purchases. Bids have been taken on 200 tons of fittings for the Chicago pumping station, with bids expected to be asked shortly on about 8000 tons of other sections. Business is providing little test of prices.

Birmingham, Ala.—Pipe foundries are operating at a better rate than for some weeks, having received a number of awards. Business prospects for February appear brighter.

Cast Pipe Placed

1400 tons, 4 to 16-inch, bell and spigot, for Washington, to United States Pipe & Foundry Co., Burlington, N. J.; bids Jan. 19. Bulk of materials includes 30,000 feet, 8-inch, at 74½ cents per foot, delivered. Bid on 9000 feet of 12-inch was $1.29 per foot, and on 5000 feet, 16-inch, $2.10 per foot.

325 tons, Columbus, O., to James B. Clow & Son, Chicago.

Steel Pipe Placed

2600 tons, 15, 16 and 18-inch o. d. lap weld pipe for Philadelphia customs house, to Spang, Chalfant & Co. Inc., Pittsburgh.

100 tons, 2-inch and under, galvanized steel or wrought iron, Panama, to Republic Steel Corp., Youngstown, O., $5133, delivered, and Allegheny Steel Co., Brackenridge, Pa., $3050, delivered, latter to furnish 20,000 feet, 2-inch; bids Jan. 9.

Cast Pipe Pending

2115 tons, 20-inch, cement lined, Massachusetts; bids in. Also 55 tons of iron castings.

1000 tons, 18 and 24-inch, miscellaneous state work, New York.

900 tons, Seattle water front improvement; date for bids about March 15.

400 tons, approximately, 24-inch, Cambridge, O.; Reconstruction Finance Corp. to purchase $25,000 bonds.

264 tons, 4, 6 and 10-inch, Fort Lewis, Wash.; Walsh Construction Co., Seattle, low, at $17,762; West Coast Construction Co., Seattle, recommended for award, at $17,772.

200 tons, fittings, Chicago pumping station; bids in.

180 tons, 6 to 10-inch, Hanover, N. Y.

150 tons, sewage treatment plant and pumping station, Lawrence, Long Island, N. Y.; bids Feb. 14.

100 tons, state hospital sewer and water lines, Brentwood, N. Y.

Unstated tonnage, 1700 feet of 8-inch; 1900 feet of 6-inch; 650 feet of 4-inch, and 14,000 feet of 2-inch, the latter galvanized, Glen Rose, Tex.; Reconstruction Finance Corp. to purchase $45,000 bonds.

Unstated tonnage, 11,000 feet of 12-inch and 5700 feet of 4-inch, Vernal, Utah; Reconstruction Finance Corp. to purchase $38,000 bonds.

Unstated tonnage, 4800 feet of 8-inch, Long Pine, Nebr.; Reconstruction Finance Corp. to purchase $15,000 bonds.

Unstated tonnage, Brookneal, Va.; Reconstruction Finance Corp. loan for $19,000 authorized.

Steel Pipe Pending

Unstated tonnage, 1504 feet, 17-inch electrically welded steel pipe, United States engineer, Cincinnati; bids Feb. 8. For engineer, Vicksburg, Miss., 250 feet, 16-inch, i. d. welded flange steel dredging pipe; Feb. 10.

Unstated tonnage, 5564 feet of 36-inch and 1182 feet of 24-inch for irrigation project, Melba, Idaho; Reconstruction Finance Corp. loan for $60,000 authorized.

ADVERTISING PAGES REMOVED

Strip

Price of Cold-Rolled Shows Weakness—Automotive Users Specify Needs Slowly

STRIP PRICES, PAGE 45

Pittsburgh—The few days of February have shown a decline in hot-rolled strip ordering from late January. Cold-rolled strip has been more active than in some time but orders are all for small lots. No change in price is reported. Although cold-rolled strip is easy at 1.90c to 2.00c, the hot-rolled base has undergone no revision and is 1.45c, Pittsburgh. The weakness in cold-rolled strip is brought about by lower prices on light cold-rolled sheets. Mill operations here continue on alternate weeks. One mill will resume this week with two or possibly three mills on, while another interest is down.

New York—While the 2.00c, Pittsburgh, price has not entirely disappeared, the usual carlot price on cold-rolled strip is 1.90c, or 2.25c, delivered locally. A little tonnage is being released by companies affiliated with the textile industry against old contracts. Hot strip is quiet at 1.45c, Pittsburgh, or 1.80c, New York.

Philadelphia—On such light cold-rolled strip business as is now moving, 1.90c, Pittsburgh, or 2.21c, delivered, is usual. Hot strip is easy at 1.45c, Pittsburgh, or 1.76c, delivered.

Cleveland—Strip releases are slackening, some General Motors units deferring a considerable portion of February specifications to March. Building and railroad equipment requirements are dull, and little is developing from barrel-makers. Though some makers of cold-rolled strip are holding for the present to 2.00c, base, Cleveland, competition from small mills recently has developed a general market range of 1.80c to 2.00c. Hot-rolled strip usually is 1.45c, base, Pittsburgh.

Chicago—Strip specifications are steady, little change being noted recently in automotive demand, although some gains are shown in orders from miscellaneous users. The 1.55c, Chicago, price for hot strip generally prevails, with cold-rolled strip relatively easier. The price is 2.00c, Pittsburgh-Cleveland.

Steel Rate Still 19, but Four Districts Recede

Pittsburgh—Steel ingot operating rates averaged a further advance of one point last week and now are at 17 per cent for all interests. Operations of Carnegie Steel Co. at Farrell, Pa., and Youngstown, O., are considerably better than at its Pittsburgh district plants, although there has been some recent slight improvement in the latter. Indication for the operating rate this week points to at least a continuation of 17 per cent. Seven out of 53 steelworks blast furnaces blowing here.

Philadelphia—Steel making operations are down to about 11 per cent as compared with 13 per cent a week ago. No immediate change is in prospect.

Operations, week ended Feb. 4	**19**
Operations, week ended Jan. 28	**19**
Operations, week ended Jan. 21	**18**
Operations, one year ago	**28.5**
High for 1932, Feb. 6	**28.5**
Low for 1932, July 9 & Dec. 24	**12**

Buffalo—This district may show no gain this week although this is the productive portion of the staggered schedule in a large local plant. This producer was to put on two furnaces over the week-end, but there was strong probability that Bethlehem would drop two at the same time, leaving six furnaces in operation, or 16 per cent of capacity.

Youngstown, O.—Steel operations here were at 20 per cent in the week ended Feb. 4, a rise of five points. Twenty-four of 83 open-hearth furnaces and three out of four bessemer plants were active. Prospects for a further small rise in production over the next month are good.

Cleveland—Steel ingot production here for the week ended Feb. 4 was 38 per cent, down 3 points from the preceding week, the Otis Steel Co. dropping one open hearth and operating four, the Corrigan, McKinney Steel Co. continuing with five, and American Steel & Wire Co. with four.

Chicago—Ingot production advanced further during the past week to about 19 per cent, the best rate since October. Little additional improvement is in immediate prospect. January pig iron production, with the exception of October, was the best in six months, although changes during that period have been slight. Six of 36 steelworks stacks and one merchant furnace continue active.

Birmingham, Ala. — Ensley rail mill of the Tennessee Coal, Iron & Railroad Co. has completed the rolling of two small orders and ingot production in this district has been reduced from 30 per cent to 20.

Pueblo, Colo.—Five open-hearth furnaces of the Colorado Fuel & Iron Co. resumed Feb. 1. One open hearth was started in the week ended Jan. 21. A blast furnace was lighted Jan. 30, on foundry iron. In preparation for this activity some iron ore and coal mines of the company have been reopened. The rail mill starts about Feb. 15.

Wire Gains Are Seasonal, Specifications Slack

Wire Prices, Page 45

New York—While the recently announced price of $1.80, Pittsburgh, on wire nails, is being shaded here, other wire products seem stable.

Worcester, Mass.—Wire buying for spring delivery improves slowly, recent price reductions generally being met by the leading interest, but with failure to stimulate business. Some fair orders have been taken in Northern New England, but unsettled prices have tended to confuse some buyers. G. F. Wright Steel & Wire Co., Worcester, is low on 10,500 square feet of galvanized wire cloth for the navy.

Philadelphia—While wire prices are fairly steady, the $1.80, Pittsburgh, price on nails recently announced is being shaded. Business is quiet.

Pittsburgh—Wire and nail specifications are slack. A leading wire producer in this district remains closed despite its intention to resume Feb. 1 when it shut down late in December. The market on nails is quoted $1.80 for straight carload lots, plain wire 2.10c and No. 9 to 11-gage woven wire fencing, $50. Rods are quoted $35, Pittsburgh.

Cleveland—Wire business placed here has improved slightly, following the recent price reduction. Orders however, are of a small, miscellaneous character.

Chicago—Recent improvement in demand for wire products has been largely seasonal and no more than had been anticipated. Distributors have increased stocks only slightly so far this year, while consumption of manufacturers' wire is improving slowly. Prices generally hold at recent levels of $1.85 in carloads for wire nails and 2.15c for plain wire.

RAW MATERIAL PRICES

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c gross ton, from Jan. 4

Asterisk denotes price change this week

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago, furnace	$15.50
Pittsburgh, dist. furnace	15.00
Pittsburgh, delivered	15.63 to 16.13
Valley furnace	14.50 to 15.00
Cleveland fur., local del.	15.00
Philadelphia, delivered	13.26 to 13.76
Virginia furnace	17.25
Granite City, Ill., furnace	16.50 to 17.50
Buffalo, fur., local del.	16.00
Buff., all-rail, Boston	18.91 to 19.91
Buff., all-rail, Brooklyn	18.90
Buff., all-rail, Newark	17.28
Ala., Bir. fur., local del.	11.00
Ala., Nor. del., Bir. base	10.00
Alabama, del. Chicago	16.01
Alabama, del. St. Louis	14.42
Alabama, del. Cincinnati	13.82
Ala., Phila., dock del.	15.00 to 15.25
Ala., Balt., dock delivery	15.00
Alabama, New York dock	15.50
Ala., Boston dock del.	15.75 to 16.75
Tenn., Bir. base, local del.	13.00
Tennessee, del. Cinci.	13.82
Montreal, delivered	23.00 to 23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local delivery	16.50
Buff., all-rail, Brooklyn	19.40
Buffalo, all-rail, Newark	17.78
Buff., all-rail, Boston	19.91 to 20.91
Virginia furnace	17.75
Eastern, del. Philadelphia	13.76 to 14.26

FOUNDRY, NO. 1X

Buffalo fur., local delivery	17.50
Eastern, del. Philadelphia	14.26 to 14.76

MALLEABLE

Valley furnace	14.50 to 15.00
Cleveland fur., local del.	15.00
Pittsburgh dis. fur.	15.00
Pittsburgh, delivered	15.63 to 16.13
Chicago, furnace	15.50
Buffalo, fur., local del.	16.50
Eastern Penna, delivered	14.63 to 15.91
Granite City, Ill., fur.	16.50 to 17.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh, district furnace	14.00
Pittsburgh, delivered	14.63 to 15.13
Eastern Penn., delivered	13.50
Buffalo fur., local delivery	15.50 to 16.00
Montreal, delivered	23.50
Valley, furnace	14.00

BESSEMER

Valley furnace	14.50 to 15.00
Pittsburgh, furnace	15.00
Pittsburgh, delivered	15.63 to 16.13

LOW PHOS.

Valley furnace, standard	25.00
Philadelphia, standard	22.76 to 25.79
Copper bear., E. Pa. fur.	20.50 to 21.50

GRAY FORGE

Valley furnace	14.00
Pittsburgh district furnace	15.00
Pittsburgh, delivered	15.63 to 16.13

CHARCOAL

Lake Superior, del. Chicago	23.04

SILVERY

Jackson County, O., fur. in per cents: 6—$18; 7—$18.50; 8—$18.75; 9—$19; 10—$19.50; 11—$20; 12—$20.50; 13—$21.50; 14—$22.50; 15—$23; 16—$24; 17—$25.50.

Pittsburgh and Buffalo furnace: 7 to 10—$19; 15—$21 to $23.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents: 10—$20.50; 11—$21; 12—$21.50; 13—$22.50; 14—$23.50; 15—$24; 16—$25; 17—$26.50.

Coke

Prices Per Net Ton

BEEHIVE OVENS

Connellsville furnace	$1.75 to 2.00
*Connellsville foundry	2.25 to 2.50
*Connellsville prem. fdry.	4.00
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., delivered	8.21 to 8.81
Chicago, ovens, outside del	7.00
Chicago, delivered	7.75
New England, delivered	10.00
St Louis, delivered	7.75
Birmingham, ovens	4.00
Indianapolis, delivered	7.75
Ashland, Ky., ovens, Connell., basis	4.50
Portsmouth, O., ovens Connell., basis	4.50
Buffalo, ovens	7.50 to 8.00
Detroit, ovens	8.00
Philadelphia, delivered	8.50

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania New Jersey furnaces (Nominal)

Foundry and basic, 56-63%, contract	7.50
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports (Nominal)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.00
North African low phos	7.00
Swedish basic, 65%	7.50 to 8.00
Swedish low phos.	8.00
Spanish, North African basic, 50 to 60%	7.00
Tungsten, spot, short ton unit, duty paid	$ 9.75 to 10.00
Newfoundland fdy., 55%	7.00
Chrome ore, 48% gross ton c.i.f.	$15.50 to 16.50

Manganese Ore

(Nominal)

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55%	nominal
South African, 52%	18 to 19 cents
South African, 49-51%	nominal
South African, 44-47%	nominal
Indian, 48-50%	nominal
Brazilian, 46-48%	17 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Maryland, Georgia, Alabama	$35.00
Missouri	32.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Md.	25.00 to 30.00
Missouri	26.00
Georgia, Alabama	30.00

SILICA BRICK

Pennsylvania	$35.00
Joliet and East Chicago	47.00
Birmingham, Ala	50.00

MAGNESITE BRICK

Per Net Ton

Burned, 9 x 4½ x 2½	$61.50
Unburned, 9 x 4½ x 2½	52.00

CHROME BRICK

Per Net Ton

F.o.b. shipping point	$42.50

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	38.00
Domes, Chewelah, Wash., base	20.90

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$26.00
Pittsburgh, bessemer	26.00
Youngstown	26.00
Cleveland	26.00
Philadelphia	31.75
Chicago	26.00
Forging, Chicago	31.00
Forging, Pittsburgh	31.00
Forging, Philadelphia	35.75

SHEET BARS

Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00
Chicago	28.00

SLABS

Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00

WIRE RODS

Pittsburgh, Cleveland	$35.00
Chicago	36.00

SKELP

All grades, Pittsburgh	1.50c to 1.60c

Ferroalloys

(In dollars, except Ferrochrome)

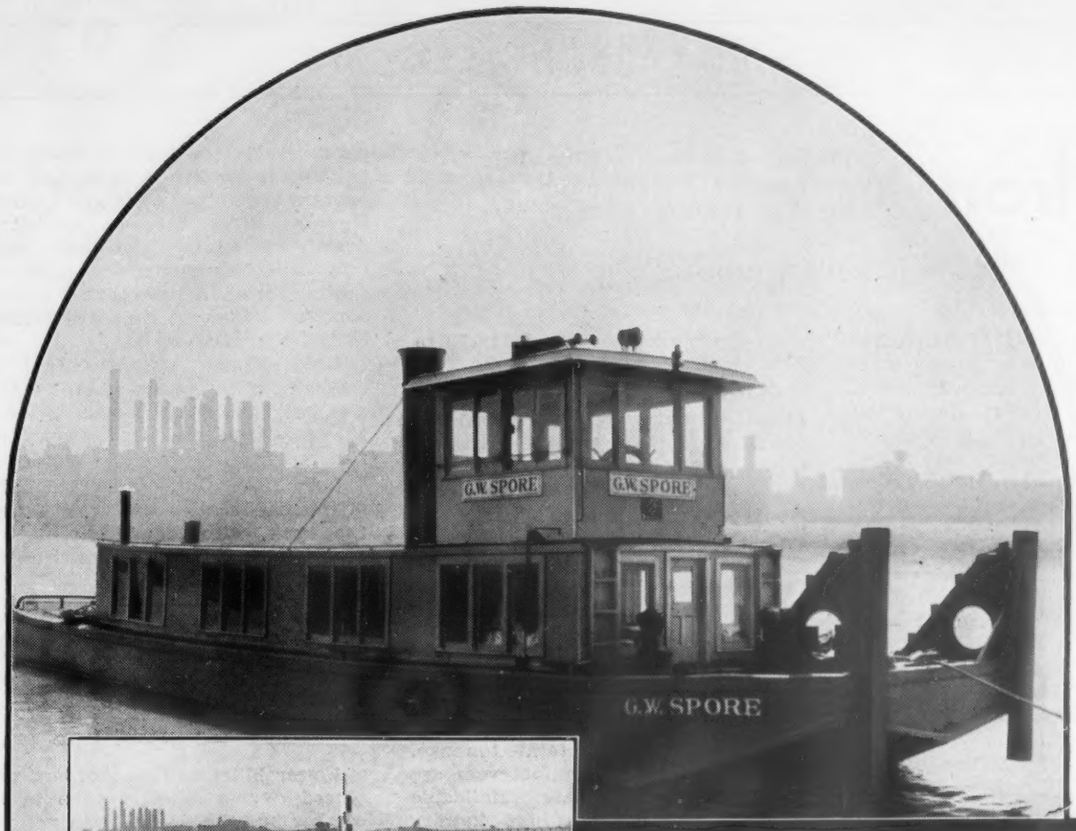
Ferromanganese, 78-82%, tidewater, duty paid	$68.00
Ferromanganese, del. Pittsburgh	73.24
Spiegeleisen, 19-20%, domestic fur. spot†	24.00
Ferrosilicon, 50 per cent, freight all., c. l.	74.50
Do, less carload	82.50
Do, 75 per cent	120.00 to 130.00
Spot, $5 a ton higher.	
Silicomang., 2½% carb.	85.00
2% carbon	90.00
1% carbon	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	9.50
Do, for spot delivery	10.00
Ferrotungsten, stand., lb. cont.	0.94 to 1.00
Ferrovanadium, 35 to 40 per cent, per lb. contained, on analysis	2.60 to 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic per ton carload, 23-26% f.o.b. Anniston, Ala.; 24%, $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60 per cent, per lb.	0.95
Cal. Molybdate, lb. cont.	0.80
Molybdate, lb. cont.	0.80

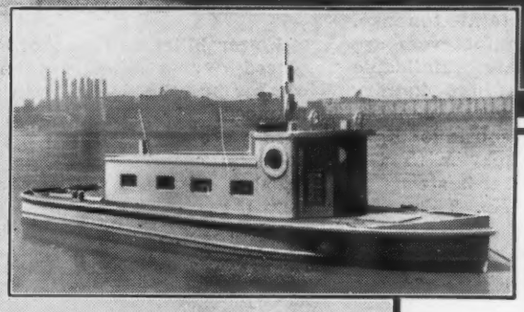
†Carloads. Differentials apply to quant.

Fluorspar

85 and 5 per cent grade

Washed gravel, f.o.b. Ill., Ky., net ton car loads	$10.50
Washed gravel, import duty paid tide, gross ton	16.50





[above]
Diesel Towboat G.W. Spore. Single screw, 180 h. p. 64′ long, 15′ wide, 5′ 6″ deep. Draft 3′ .0. Hull built of ¼″ Granite City plate, electric welded throughout. Built in 30 days due to quick delivery of steel.

[below]
Fully equipped, Diesel Boat, for Mexican service, complete with electric starting and independent light plant. Draws only 14″ of water. 60 h. p., 40′ 6″ beam, 10 m. p. h. Hull built of Granite City plate electric welded.

This STEEL— Cuts Building Time and Costs • • •

MODERN traffic requirements on our inland rivers demand motive equipment that is faster—more efficient—more economical.

The St. Louis Structural Steel Company, designers and builders of rivercraft, is meeting this demand with screw driven tug boats built of Granite City Steel.

They give much credit for their quick delivery of boats to the cooperation of the Granite City Steel Company in furnishing steel promptly. They also report that this steel, because it is clean, accurately sheared and of fine welding quality, provides the results required at an important saving on production costs and delivery time.

And Granite City Steel service matches Granite City Steel quality. Twenty-nine railroads and the Mississippi River expedite delivery from Granite City, Illinois, to the Mississippi Valley, the West and the Southwest.

Chicago—Dallas
Kansas City

SINCE
GRANITE CITY STEEL
1878

St. Louis—St. Paul
Salt Lake City

GALVANIZED SHEETS
STEEL SHEETS
PLATES AND
TIN PLATE

•

GRANITE CITY STEEL CO
GRANITE CITY, ILLINOIS

Pig Iron

Imports Heavier, Including 4000 Tons of Dutch—Railroad Malleable Inquiry Better

PIG IRON PRICES, PAGE 54

Pittsburgh—No notable change has occurred in the merchant iron market here, although carload orders were a little less frequent during the past week than early in January. Pittsburgh Steel Foundry Co., Glassport, Pa., has booked approximately 500 tons of castings for use on the Marmet and London, W. Va., locks which Dravo Contracting Co., Pittsburgh, is building. The same company recently received an order for about 700 tons of castings for locks No. 2 and No. 3 on the Allegheny river. Pig iron shipments for ingot molds were the best in January of some months. Prices continue largely nominal.

Boston—Pig iron buying continues in small lots, with a wide range of prices and a tendency to easiness. No. 2X southern iron is $10.50 furnace. The New England furnace is holding to its recent base price, but reports of shading on small lots for outside domestic iron are prevalent.

New York—Orders and shipments are slow, with foundry operations in this district under 15 per cent. Approximately 4000 tons of Royal Dutch iron arrived at Bridgeport, Conn., recently. Buffalo foundry iron is unchanged at $14, furnace, for this territory, and eastern Pennsylvania iron is $12.50 to $13, furnace.

Philadelphia—Little variation is noted in the light volume of pig iron buying. Eastern Pennsylvania foundry iron is unchanged at $12.50 to $13, furnace, and basic at $13.50, delivered eastern Pennsylvania.

Buffalo—Demand continues restricted to carloads for immediate delivery. In the East foreign competition is more severe with prices reported $4 to $5 below production cost at Buffalo. Only one furnace here is in production.

Cleveland—Labor trouble in the Ford units at Detroit has slowed up shipments of pig iron to foundries making Ford parts, but the latest information is that the difficulty is being cleared up and releases will be forthcoming shortly. The movement to other automotive interests is well sustained and furnace interests expect tonnage for the month in the aggregate, on a daily average basis, will be fully equal to that of January. Sales during the week were lighter, not exceeding 2000 tons. The price for local delivery is nominal at $15, base, furnace, with requirements limited to an occasional carload. For outside shipment $13.50 to $14 usually apply.

Cincinnati — Reports that some foundries, out of production several weeks, plan to resume shortly give a better outlook to the pig iron market here. Shipments on old contracts have not shown much improvement.

Chicago—January pig iron shipments were about 25 per cent heavier than those of December, and are expected to show a further increase this month. Improvement to a large extent is the result of better demand from small consumers, with the automotive industry contributing a large portion of total tonnage. Farm implement manufacturers are operating at a low rate. Malleable foundries report the best inquiry from railroads in several months. Foundry operations continue light but are moderately heavier than a month ago. The market is steady at $15.50, furnace, for No. 2 foundry and malleable.

St. Louis—Shipments of pig iron on contracts continue fairly steady, but except for a few small spot lots melters are not making new commitments. Blast furnaces report a dearth of inquiry, and their books now have less tonnage than in any similar period in more than a decade. January shipments exceeded December's by a good margin.

Birmingham, Ala.—A slight increase in consumption at pipe foundries has not been reflected as yet in the pig iron market. Prices are steady.

Toronto, Ont.—Moderate improvement in sales was noted during the week, with orders totaling 600 tons, in single car lots. Prices are steady.

Sheet Bar Price Nominal; Billets and Bars Steady

Semifinished Prices, Page 54

Fewer billet and slab orders were placed during January than in December but the decline was not pronounced. In some districts sheet bars were more active. There has been no official change in semifinished steel prices, and $26, Pittsburgh, represents the billet and slab market, and $35 the wire rod market. Sheet bars are nominal at $26.

Coke

Foundry Fuel Easier at Pittsburgh—Shipments in Middle West Are Slower

COKE PRICES, PAGE 54

Pittsburgh—Heating coke still is moving slowly, this grade holding at about $1.50, with furance coke $1.75. Although little foundry coke is being sold, the price is easy and common grades have been sold down to $2.25. Premium brands remain $4, ovens.

New York—Shipments on metallurgical coke contracts are a little lighter. Beehive furnace coke continues $1.50 to $2, and $2 to $2.15, Connellsville, for the heating and smelting grades, respectively, and beehive foundry coke $2.50 to $4, western Pennsylvania ovens, depending upon analysis. By-product foundry coke also is unchanged, holding at $8.21 to $8.81, Newark, N. J.; $10, New England; and $8.50, Philadelphia.

Chicago—Despite a slight increase in foundry operations last month, foundry coke shipments declined following six consecutive monthly increases. An upturn is in prospect for February, however. Demand for heating coke was retarded considerably by the mildest January in 50 years. By-product foundry coke continues $7, ovens, for outside delivery, and $7.75, delivered Chicago.

Cincinnati—Demand for by-product foundry coke improved during the past week, some of the increase being for automotive parts foundries. Domestic shipments are off.

St. Louis—By-product coke interests are experiencing little change from the quiet conditions that existed in January. Production is expected to drop slightly this month. Prices are unchanged.

Birmingham, Ala., — By-product coke ovens in this district have maintained a fairly good average rate of operations during the winter months and this is expected to continue for some time, with shipments to outside districts. The foundry grade holds at $4, base, Birmingham.

Scrap

Export Demand Moves Tonnages from Eastern Market—Price Shows Upward Tendency

Chicago—The scrap market is quiet but steady. Mill shipments are the heaviest in a number of weeks as a result of an upturn in open-hearth operations, but new buying is lacking. Old material is coming out slowly and prices are steady, with heavy melting continuing $5 to $5.50. Dealers are unable to buy freely at less than $5.25. Occasional gains are noted in orders from small scrap consumers, involving only light tonnages. Other quotations are unchanged.

New York—Most scrap moved in this area is for export at unchanged prices for No. 1, but with $4 paid for some No. 2, although $3.50 still generally holds for the latter. The present export movement will approximate 35,000 to 40,000 tons. Some

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	7.50 to 8.00
Boston, dealers	3.00 to 3.25
Buffalo, No. 1	7.00 to 7.50
Buffalo, No. 2	6.00 to 6.50
Chicago	5.00 to 5.50
Cleve., No. 1	7.00 to 7.50
Cleve., No. 2	6.00 to 6.50
Det., No. 1 deal.	4.50 to 5.00
Det., No. 2 deal.	3.75 to 4.25
E. Pa. del. mill	6.50
E. Pa., No. 2 del.	4.50 to 5.00
Federal, Ill.	4.75 to 5.25
Granite City, Ill.	5.00 to 5.50
N. Y., deal. R. R.	5.00
N. Y. deal. No. 2	3.50 to 4.00
N. Y. deal. yd.	2.50 to 3.00
Pitts. No. 1	8.00 to 8.50
St. L. No. 1 sel.	5.50 to 6.00
Valleys, No. 1	8.50 to 9.00

COMPRESSED SHEETS

Buffalo, dealers	6.00 to 6.50
Chi. (Factory)	4.00 to 4.50
Cleveland	6.50 to 7.00
Detroit, dealers	4.00 to 4.50
E. Pa. new mat.	5.00 to 6.00
Pittsburgh	7.75 to 8.25
Valleys	8.00 to 8.50

BUNDLED SHEETS

Buffalo	4.00 to 4.50
Cincinnati, del.	4.00 to 4.50
Cleveland	4.50 to 5.00
Eastern, Pa.	5.00
Pittsburgh	6.75 to 7.25
St. Louis	1.50 to 2.00

SHEET CLIPPINGS LOOSE

Chicago	2.00 to 2.50
Cincinnati	1.50 to 2.00
Detroit, dealers	1.25 to 1.75
St. Louis	1.50 to 2.00

STEEL RAILS SHORT

Birmingham	8.50 to 9.00
Boston, dealers	3.00 to 3.25
Buffalo	9.50 to 10.00
Chicago (3 ft.)	7.50 to 8.00
Chicago (2 ft.)	8.00 to 8.50
Cincinnati, del.	8.50 to 9.00
Detroit, deal.	8.00 to 8.50
Pitts. (open-hearth, 3 ft. and less)	10.00 to 10.50
St. Louis	7.00 to 7.50

STOVE PLATE

Birmingham	5.00 to 5.50
Boston, dealers	2.00 to 2.50
Buffalo	7.25 to 7.50
Chicago, net	4.50 to 5.00
Cinci., deal. net	3.50 to 4.00
Det., net deal.	2.50 to 3.00
Eastern, Pa.	6.00
N. Y., deal. mill	2.50 to 3.00
St. Louis	5.50 to 6.00

COUPLERS, SPRINGS

Buffalo	8.50 to 9.00
Chicago	6.50 to 7.00
Eastern Pa.	8.00 to 8.50
Pittsburgh	9.00 to 9.50
St. Louis	5.25 to 6.25

ANGLE BARS—STEEL

Chicago	7.00 to 7.50
St. Louis	5.75 to 6.25

LOW PHOSPHORUS

Buffalo, billets and bloom crops	8.50 to 9.00
Cleveland bil. and bloom crops	10.00 to 11.00
Eastern Pa.	8.00 to 8.50
Pittsburgh billet bloom crops	10.00 to 10.50
Pitts., sheet bar crops	10.00 to 10.50

FROGS, SWITCHES

Chicago	5.00 to 5.50
St. Louis	5.00 to 5.50

SHOVELING STEEL

Chicago	5.00 to 5.50
Cleveland	5.75 to 6.00
St. Louis	4.75 to 5.25

RAILROAD WROUGHT

Birmingham	7.50 to 8.00
Boston, dealers	1.00 to 1.50
Buffalo, No. 1	4.50 to 5.00
Buffalo, No. 2	7.00 to 7.50
Chi., No. 1, net	4.50 to 5.00
Chicago, No. 2	5.00 to 5.50
Cinci., No. 2	5.00 to 5.50
Eastern Pa.	6.50
N. Y., No. 1, deal.	2.50 to 3.00
Pitts., No. 2	8.00 to 8.50
St. Louis, No. 1	3.50 to 4.00
St. Louis, No. 2	5.00 to 5.50

SPECIFICATION PIPE

Boston	3.00 to 4.00
Eastern Pa.	7.00 to 7.50
N. Y., deal	2.00 to 2.25
St. Louis	4.75 to 5.25

BUSHELING

Buffalo, No. 1	6.00 to 6.50
Chicago, No. 1	3.50 to 4.00
Cinci., No. 1 dl.	4.00 to 4.50
Cinci., No. 2	2.50 to 3.00
Cleve., No. 2	3.00 to 3.50
Det., No. 1 new deal.	3.50 to 4.00
St. L., No. 1	3.00 to 3.50
Val. new No. 1	8.50 to 8.75

MACHINE TURNINGS

Birmingham	2.50 to 3.00
Boston, dealers	0.75 to 1.00
Buffalo	3.75 to 4.25
Chicago	3.00 to 3.50
Cinci., deal	3.00 to 3.50
Cleveland	4.50 to 5.00
Detroit	1.75 to 2.25
Eastern Pa.	3.00 to 3.50
N. Y., deal.	1.35 to 1.50
Pittsburgh	6.25 to 6.75
St. Louis	1.50 to 2.00
Valleys	6.25 to 6.75

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	0.75 to 0.90
Buffalo	3.50 to 3.75
Cinci., deal	3.00 to 3.50
Cleveland	4.50 to 5.00
Detroit, deal	2.25 to 2.75
Eastern Pa.	3.50 to 3.75
N. Y., deal.	1.35 to 1.50
Pittsburgh	5.50 to 6.00

CAST IRON BORINGS

Birming., chem.	12.00 to 13.00
Birming., plain	2.50 to 3.00
Boston, chem.	5.50 to 6.00
Boston, dealers	1.00 to 1.25
Buffalo	4.25 to 4.50
Chicago	3.00 to 3.50
Cinci., deal.	3.00 to 3.50
Cleveland	4.50 to 5.00
Detroit, deal.	2.25 to 2.75
Eastern Pa.	3.50 to 3.75
E. Pa., chem.	8.00 to 10.00
N. Y., deal.	1.00 to 1.50
Pittsburgh	5.50 to 6.00
St. Louis	2.00 to 2.50

PIPE AND FLUES

Cinci., deal.	3.25 to 3.50

RAILROAD GRATE BARS

Buffalo	4.00 to 4.50
Chicago, net	5.00 to 5.50
Cincinnati	4.00 to 4.50
Eastern Pa.	5.50 to 6.00
N. Y., deal.	3.50 to 4.00
St. Louis	4.50 to 5.00

FORGE FLASHINGS

Boston, dealers	2.00 to 2.50
Buffalo	5.50 to 6.00
Cleve. ov. 10 in.	6.00 to 6.50
Detroit	2.75 to 3.25

FORGE SCRAP

Boston, dealers	1.75 to 2.00
Chicago	6.50 to 7.00
Eastern Pa., del.	5.00 to 5.50

ARCH BARS, TRANSOMS

Chicago, net	5.00 to 5.50
St. Louis	3.50 to 4.00

AXLE TURNINGS

Boston, deal.	2.50 to 3.00
Buffalo	6.25 to 6.75
Chi., elec. fce.	4.50 to 5.00
Cleveland	5.50 to 6.00
Eastern Pa., del.	7.00
Pittsburgh, O. H.	7.00 to 7.50
St. Louis	3.00 to 3.50

STEEL CAR AXLES

Birmingham	9.00 to 9.50
Boston, ship. pt.	5.50 to 6.50
Buffalo	10.00 to 10.50
Chicago, net	8.50 to 9.00
Eastern Pa.	14.50
St. Louis	8.75 to 9.25

SHAFTING

Boston, ship pt.	6.50 to 7.00
Eastern Pa.	11.00 to 12.00
N. Y., deal.	5.50 to 6.00
St. Louis	7.50 to 8.00

CAR WHEELS

Birming., iron	7.00 to 7.50
Boston, iron deal.	3.00 to 3.25
Buffalo, iron	7.00 to 8.00
Buffalo, steel	8.50 to 9.00
Chicago, iron	7.50 to 8.00
Chi., rolled steel	7.00 to 7.50
Cincinnati iron	6.25 to 6.75
E. Pa. iron	8.50
E. Pa. steel	8.00 to 8.50
Pitts., iron	8.00 to 8.50
Pitts., steel	9.00 to 9.50
St. Louis, iron	4.75 to 5.25
St. Louis, steel	6.00 to 6.50

NO. 1 CAST SCRAP

Birmingham	8.00 to 8.50
Boston, textile	6.75 to 7.00
Boston, No. 2	2.00 to 2.25
Buffalo (Mach.)	9.75 to 10.25
Buffalo, cupola	9.00 to 9.50
Chi., mach. net	5.75 to 6.25
Chi., railroad net	5.50 to 6.00
Chicago, agri., net	5.00 to 5.50
Cinci., mach. cup	6.50 to 7.00
Cleve. cupola	7.00 to 8.00
Det., net deal.	6.50 to 7.00
E. Pa. cupola	9.00 to 9.50
N. Y., cup. deal.	4.50 to 5.00
N. Y., del. local foundries	7.00 to 7.50
Pitts., cupola	9.00 to 9.50
San Fran., del.	13.50 to 14.00
Seattle	4.50 to 6.50
St. L. No. 1 mach.	6.00 to 6.50
St. L. No. 1	5.50 to 6.00

HEAVY CAST

Boston, del.	3.00 to 3.25
Bost., mach. cast	7.00 to 7.50
Buffalo, break	6.50 to 7.00
Cleve., break	5.50 to 6.00
Detroit, auto net deal.	7.00 to 7.50
Det. break., dl.	4.00 to 4.50
Eastern Pa.	8.00
N. Y. No. 1, dl.	4.50 to 5.00
N. Y. break, dl.	4.00 to 4.50
Pittsburgh	8.00 to 8.50

MALLEABLE

Boston, consum.	6.75 to 7.25
Buffalo	8.00 to 8.50
Chicago, agri.	5.00 to 5.50
Chicago, R. R.	5.50 to 6.00
Cinci., agri. del.	6.00 to 6.50
Cinci., R. R., del.	6.50 to 7.00
Cleveland, rail	7.50 to 8.00
Det. auto deal.	5.00 to 5.50
St. Louis	7.00 to 7.50

RAILS FOR ROLLING

5 feet and over

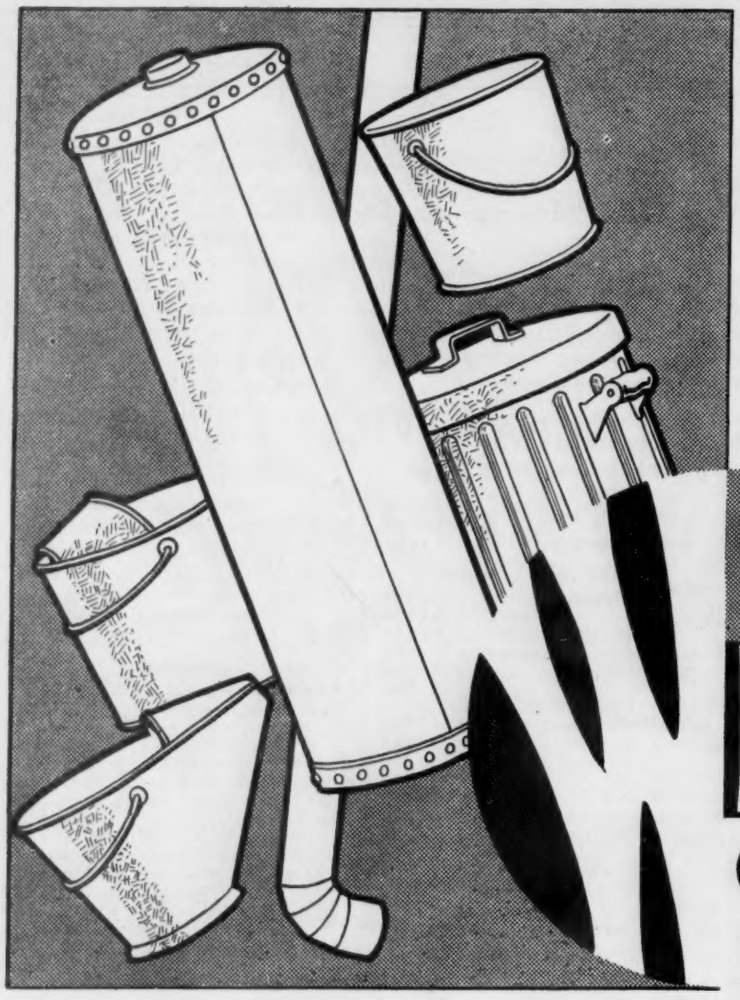
Birmingham	8.00 to 9.00
Boston, deal.	5.00 to 5.50
Buffalo	7.00 to 7.50
Chicago	7.50 to 8.00
Eastern Pa.	9.50
New York dealer	3.75 to 4.25
St. Louis	7.00 to 7.50

LOCOMOTIVE TIRES

Chicago, cut	7.00 to 7.50
St. L., No. 1	5.00 to 5.50

LOW PHOS. PUNCHINGS

Chicago	7.00 to 7.50
Buffalo	9.00 to 9.50
Eastern Pa.	8.00 to 8.50
Pittsburgh	9.50 to 10.00



SAVE WITH STEEL

WEIRTON GALVANIZED SHEETS

WEIRTON PRODUCTS INCLUDE:

Pig Iron
Open Hearth Steel
Billets—Slabs—Sheet Bars—Skelp
Angles, Beams and Channels
Round, Square and Flat Bars
Rails—Steel Plates—Tie Plates—Track Spikes
Splice Bars
Reinforcing Bars
Coke Tin Plate
Kanners Special Cokes—
Best Cokes—Charcoals
Lacquered and Coated Tin Plate
Tin Mill Black Plate (All Finishes)
Lacquered and Coated Black Plate
Open Hearth Copper Bearing Terne
Plate 8 lb. to 40 lb. Coated
Hot and Cold Rolled Strip Steel
and
Strip Steel Sheets
High Finish Sheets
Long Terne Sheets
(Common and Special Finishes)
Galvanized, Black and Blue
Annealed Sheets
Corrugated Sheets, V Crimp
Sheets, Roll Roofing
Single Pickled, Full Finished
and Auto Body Sheets
Coke—Tar—Benzol—Toluol—
Ammonium Sulphate

Many gauges and grades up to seventy-five inches in width are now available.

WHATEVER your requirements in galvanized sheets may be, consult Weirton. Ownership control from ore mines to finished product together with modern equipment and a complete staff of specialists enable us to meet any specifications correctly and promptly.

WEIRTON STEEL CO.

Division of National Steel Corporation

WEIRTON W. VA.

SALES OFFICES IN ALL PRINCIPAL CITIES

stove plate is still moving to Bayonne, N. J., at $4.50, barge. Heavy cast scrap for delivery to Coatesville at $8 is slightly firmer.

Boston—Activity in scrap is confined largely to export, more than 4000 tons having been assembled for Japan and Danzig. Domestic buying is light and water shipments to eastern Pennsylvania are smaller.

Philadelphia—A cargo of No. 2 steel has been purchased here for export to Europe, presumably Italy or Poland. These will be the first shipments of scrap to have left Philadelphia for export since about 1920. No. 1 steel for Japan is being bought at about $6, aboard ship, instead of alongside ship as previously noted. Domestic trading is dull, with Bethlehem Steel Co. buying small quantities of No. 1 steel for Johnstown, Pa., at $8 delivered. A slight upward revision in new compressed sheets features the price situation.

Buffalo—Scrap has relapsed into inactivity like that of the year end. Recent small purchases of heavy melting steel have not been followed by additional buying. The market is nominally firm.

Pittsburgh—Two railroad scrap lists were the center of interest last week. The 39,000-ton Pennsylvania list closed Feb. 1 and Baltimore & Ohio, 6540 tons, Feb. 6. Some clarification of the No. 1 heavy melting steel market is expected when these lists have been disposed of but probably only in part. In the meantime, this grade is quoted $8 to $8.50 and shows little strength. Another small purchase of No. 2 heavy melting steel was made into consumption here at $7.25 to $7.75.

Cleveland—Most grades of iron and steel scrap are being moved in this district and northern Ohio, the first activity since the year opened. While the grades now moving are varied in number, tonnages are small. Report in local trade circles is that the next shipment of scrap from Detroit on the whaleback steamer HENRY CORT will be a cargo of turnings consigned to a district steelmaker. This steamer can carry about 3000 tons of scrap, and being equipped with two locomotive cranes, it is a self-unloader.

Detroit—A stronger tone is evident in iron and steel scrap. Production has not increased appreciably, for one reason because of strikes, while dealers have old orders outstanding and are competing with each other sufficiently to strengthen prices. There is a general feeling that the market is firmer and definitely headed for higher prices within the next month. An unusual movement was the water shipment of about 3000 tons of bundles to a Cleveland steelworks Jan. 28. Further shipments by water are probable, provided navigation permits.

Cincinnati—Several mills accept scrap on contract, or on odd lot sales, but the market in general remains dull. Quoted prices are nominal.

St. Louis—The market for iron and steel scrap maintains the slightly firmer undertone which developed at the end of January, but trading is light. Shipments of steel recently purchased are going forward and deliveries on other contracts make a better showing than expected in view of the low stage of the general melt.

Birmingham, Ala.—Less steel and iron scrap is moving now than during December. Prices are unchanged.

Toronto, Ont.—Demand for iron and steel scrap is spotty. While there is a fair call for iron grades steel lines are at a standstill. No. 1 machinery cast is moving somewhat better than a few weeks ago and dealers are reporting shortage of supplies. No large tonnages have been forthcoming, however.

Equipment

Italy, Poland and Russia Inquire for Machinery

Pittsburgh—The steel mill equipment market shows no noticeable change and rolling mill and roll manufacturers in this district are noting no improvement in their business. Parts for repair purposes predominate in scattered buying. According to one authority, the modernizing and re-equipping of industrial plants that have been idle for months or even years, will provide the most effective means to lift the industrial situation out of depression. It is estimated that expenditure of $125,000,000 in this modernizing work could be realized conservatively and much of this total could, of course, be logically expected from steel capacity out of repair.

Cylindrically welded steel gates to be used on the Hoover dam were bid by several interests in this district recently and contract was awarded this week to the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Each of eight cylinders in the gate is 32 feet in diameter, 8 feet high and weighs 375 tons. Fabricating, machining and welding will be done in the East Pittsburgh, Pa., shops of the company. Low bid on metal linings for the tower inlets of the Hoover dam was made by the Goslin-Birmingham Mfg. Co., Birmingham, Ala.

Worcester, Mass.—Domestic buying of machinery is light and with few exceptions shops are operating on curtailed schedules, although some note a spotty improvement. Placing of a large volume of Russian business in this country, on which some New England builders have bid, depends as usual on credit acceptances. The bulk of the navy list for Portsmouth on which bids were taken several weeks ago is still unplaced. Norfolk navy yard is inquiring for two boring mills.

New York—Additional inquiry and buying of machinery for export includes some recent volume with Italy, buyers from that nation placing a list of lathes with American sellers. Russia has quotations on a large number of tools, but apparently has closed on little of the equipment, placing of the business depending on usual long credit terms. For the time being, Japanese buyers are out of the market after placing substantial business here, but are expected to renew inquiry for more machinery in a few weeks. Domestic inquiry and buying is light, being limited to one or two tools at a time.

In addition to the foreign volume already noted there have been inquiries from Poland and several other countries. Automobile model changes this year brought little business to machine tool builders, although body changes were generally made which resulted in extensively die buying.

Cleveland—The equipment market continues quiet, the only feature being a slight pickup in sales of used machinery. These are probably accounted for by the extremely low prices usually prevailing.

Chicago—Considerable caution is in evidence on the part of buyers of machine tools and plant equipment, orders and inquiries generally lacking improvement. Several inquiries are pending in this district for presses but, as in the case of other machinery, quoted prices are low and used equipment frequently is being sought.

Kearney & Trecker Corp., Milwaukee, has booked an order for 15 milling machines, with special tooling and cutters, from the Japanese firm of Mitsubishi Shoji Kaisha, Tokio. The order is valued at between $75,000 and $80,000, and will provide employment for about 100 former employes for several months.

Nonferrous Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 5.50c, Conn., for copper

SHEETS	
Yellow brass (high)	11.00
Copper, hot rolled	13.62½
Lead sheets, cut, to jobbers	7.00
Zinc sheets (100-lb. base)	9.00
TUBES AND PIPES	
Seamless yellow brass (high)	13.25
Seamless copper	12.37½
RODS	
Yellow brass (high, full turning)	8.50
Naval brass	9.62½
ANODES	
Copper, untrimmed	10.50
WIRE	
Yellow brass (high)	11.00

Old Metals

Dealers' buying prices, cents lb.

NO. 1 COMPOSITION RED BRASS	
New York	2.37½ to 2.62½
Chicago	2.00 to 2.12½
Cleveland	2.25 to 2.50
St. Louis	2.25
HEAVY YELLOW BRASS	
New York	1.75 to 1.87½
HEAVY COPPER AND WIRE	
New York	3.50 to 3.75
Chicago, No. 1	2.87½ to 3.00
Cleveland	2.75 to 3.00
St. Louis	2.50
COMPOSITION BRASS BORINGS	
New York	2.25 to 2.50
YELLOW BRASS TUBING	
Cleveland	1.50 to 1.75
LIGHT COPPER	
New York	2.62½ to 2.75
Chicago	2.00 to 2.12½
Cleveland	2.25 to 2.50
St. Louis	2.25
LIGHT BRASS	
Chicago	0.87½ to 1.00
Cleveland	1.00 to 1.25
St. Louis	1.25
LEAD	
New York	2.00 to 2.25
Cleveland	1.50 to 2.00
Chicago	1.75 to 2.00
St. Louis	2.00
ZINC	
New York	1.12½ to 1.25
Cleveland	1.00 to 1.12½
Chicago	1.00 to 1.12½
St. Louis	1.25
ALUMINUM	
Clippings, new, soft, Cleve.	9.50 to 10.00
Clippings, hard, Cleveland	6.00 to 7.00
Borings, Cleveland	2.50 to 3.00
Mixed cast, Cleveland	4.00 to 4.50
Mixed cast, St. Louis	4.00 to 4.25

Secondary Metals

Brass ingot, 85-5-5-5	5.25
Remelt aluminum No. 12	8.00 to 9.00

Metals

Lead Demand Continues Most Active—Copper Holds but Is Dull—Zinc Eases—Tin Firmer

New York—Consumer interest in the metals continued to lag last week with the exception of lead. Quotations held relatively steady except for zinc which was forced downward to the lowest level since last August.

Copper—Little activity developed in the copper market last week. Custom smelters were willing to sell electrolytic metal through the remainder of the current quarter at 5.00c. A few also would take business for second quarter on this basis. Mine producers held aloof from the market. Little advance in copper prices is looked for in the next few months in view of the heavy stocks overhanging the market and the slow pace of industrial activity which gives little promise of improving materially during at least the first half of 1933.

Lead—Sellers have officially opened their books on metal for March shipment but the bulk of business last week was for prompt and nearby positions. A little business, however, was taken for April shipment in connection with orders for March. Belief is growing in the trade that lead prices have touched bottom. Lead production is reported to be showing a downward tendency.

Zinc—Selling pressure in the market forced prime western metal down to 2.80c, East St. Louis, the lowest level since last August. Only a few weeks ago the metal was quoted up to 3.50c. Slow consumer demand and increasing stocks, in addition to the breakup of the European zinc cartel are blamed for the easier market. Easiness in galvanized sheets recently also is a factor.

Tin—The market presented a firmer appearance with the announcement that world visible supplies declined 1573 tons in January to the lowest level in two years. Straits tin was quoted at a high for the week of 23.50c. Consumers, however, still showed little interest in the market.

Aluminum — Demand continued slow with prices steady.

Antimony—Prices showed a slight tendency toward easiness. Buying was slow.

Sulphate Is More Active

New York—Sulphate of ammonia prices for February are unchanged at $22 a ton, port, with seasonal buying under way. Distillate prices are unchanged and steady. Naphthalene demand on contracts has picked up, but many consumers are slow to order out material. Routine business continues in phenol at unchanged prices.

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.20
90 per cent benzol	0.20
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per Pound at Producers' Plants in 250-Pound Drums

Phenol	0.153 to 0.173

Per Pound at Producers' Plants

Naphthalene flakes	4.75 to 5.75
Naphthalene balls	4.75 to 5.75

Per 100 Pounds Atlantic Seaboard

Sulphate of ammonia	$1.10

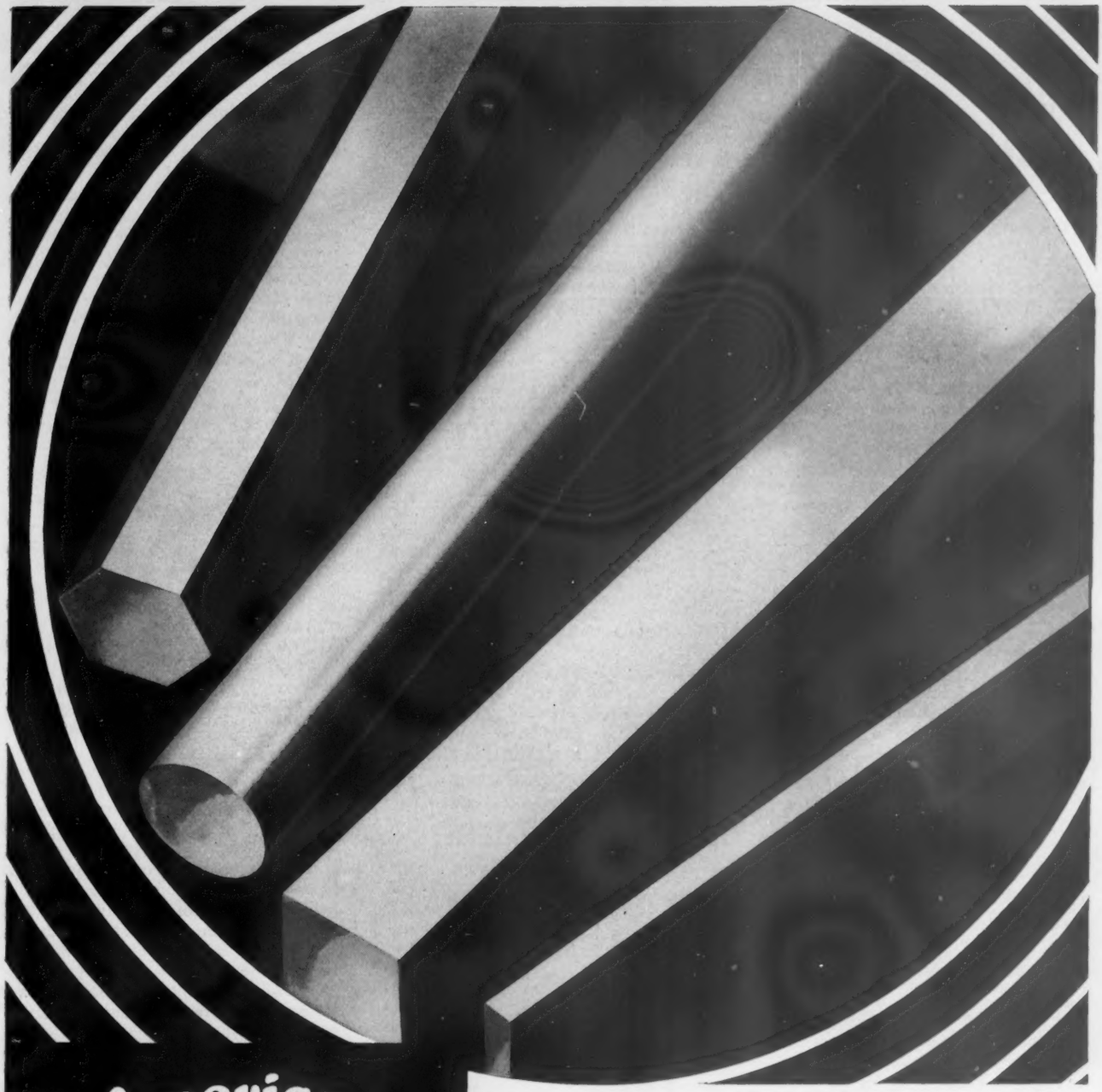
Quicksilver Quiet

New York—Demand for quicksilver continues quiet, with the market generally unchanged at $48 a virgin flask of 76 pounds in round lots, and $49 a flask in small lots. Reports to the department of commerce show that total imports of quicksilver last year were 616,649 pounds, compared with 27,054 pounds in 1931.

Nonferrous Metal Prices of the Week, Cents a Pound

Spot unless otherwise specified

	Copper			Straits Tin		Lead	Lead	Zinc	Aluminum	Antimony	Ingot
	Electro., del. Conn.	Lake, del. Midwest	Casting, refinery	New York Spot	New York Futures	N. Y.	East St. L.	St. L.	98-99%	Spot, N. Y.	Nickel
Jan. 28	5.00	5.12½	4.75	23.00	23.12½	3.00	2.87½	2.90	22.90	5.80	35.00
Jan. 30	5.00	5.12½	4.75	23.10	23.22½	3.00	2.87½	2.90	22.90	5.80	35.00
Jan. 31	5.00	5.12½	4.75	23.50	23.62½	3.00	2.87½	2.85	22.90	5.80	35.00
Feb. 1	5.00	5.12½	4.75	23.25	23.45	3.00	2.87½	2.85	22.90	5.75	35.00
Feb. 2	5.00	5.12½	4.75	23.50	23.70	3.00	2.87½	2.80	22.90	5.75	35.00
Feb. 1	5.500	5.12½	4.75	23.45	23.65	3.00	2.87½	2.80	22.90	5.75	35.00



American QUALITY Steel & Wire Company

COLD FINISHED STEEL BARS

The "Workability" You Want

The amazing variety of parts that are today made from American Quality Cold Finished Steel Bars in carbon steels and alloys is all the more reason why you should consult our engineers. Some one certain type or grade is sure to meet your needs best and most economically—in machining qualities and cutting speeds. Our extensive facilities for furnishing the best in analysis and drawing bring you every assurance of reliability.

1831 — MORE THAN 100 YEARS of PROGRESS IN WIRE MAKING — 1933

AMERICAN STEEL & WIRE COMPANY

208 South LaSalle Street, Chicago — SUBSIDIARY OF UNITED STATES STEEL CORPORATION — And All Principal Cities

Pacific Coast Distributors. Columbia Steel Company, Russ Building, San Francisco — *Export Distributors:* United States Steel Products Company, New York

Europe

British Market Making Gains While Continent Finds Trade Quieter—Iron Stocks Growing

London—(*By Cable*)—Home trade in pig iron in the Middlesbrough area is more active. Some Scottish iron and steel and some sheets have been sold for the Far East. Stocks of hematite are accumulating on the East Coast. Trade in the Midlands is quiet. In general, prices are firm. Galvanized sheets show increased activity. Continental reports are of quiet conditions following recent orders from the Far East.

Pacific Coast

Most Lots Are Small—Ban on Foreign Pipe Is Voted

San Francisco—(*By Air Mail*)—Movement of iron and steel products on the Pacific coast is in small tonnages, although several fair sized lots of shapes were reported placed. The largest of these called for 950 tons for an addition to the San Francisco postoffice, placed with the McClintic-Marshall Corp. Among the new inquiries is 4800 tons of shapes and 500 tons of reinforcing bars for the federal building in the civic center, San Francisco, bids on which will be opened Feb. 28.

Awards of reinforcing steel bars totaled less than 1000 tons. Unnamed interests secured 265 tons for highway work in San Bernardino county, Calif., for the state and 150 tons for a postoffice at Beverly Hills, Calif. Bids have been opened on 1500 tons for a building at Fort Mason, Calif. Bids will be taken soon on 100 tons for a bridge at Twenty-third avenue, Oakland. Out-of-stock prices are weak at 2.00c, base, on carload lots. Mild steel bars hold generally at 2.10c, c.i.f.

Plate demand remains exceptionally quiet and no awards of importance have been noted during the past two weeks. Bids have been opened on over 200 tons for gates for the Hoover Dam, Boulder City, Nev. Mare Island will open bids Feb. 1 for 200 tons of cold-rolled sheet steel. Prices have weakened and as low as 1.85c, c.i.f., has been named.

McClintic-Marshall Corp. secured 360 tons for a postoffiice at Beverly Hills, Calif. Unnamed interests took 611 tons for a bridge over the Colorado river, Mesa county, Colorado. Plain standard shapes hold at 2.10c, c.i.f. with wide flange material 2.20c.

Bids have been opened on 1290 tons of cast iron pipe for Pasadena, Calif., and on 570 tons of 6-inch pipe for Oakland, Calif. Santa Cruz, Calif., has opened bids on 129 tons of 4 and 8-inch pipe.

Seattle Bars French Pipe

Seattle—Seattle city council has approved specifications eliminating high tensile French cast iron pipe for the waterfront improvement. This project involves about 900 tons. Bids will be opened in March. Included in a Seattle water department improvement project is a 42-inch steel pipe installation several miles in length. Date for bids is not yet set.

Awards this week totaled approximately 600 tons of reinforcing, structurals and plates. For state jobs in Klickita, Okanogan and Whatcom counties, Washington, 140 tons of concrete bars went to unnamed interests. Pacific Car & Foundry Co., Seattle, booked 245 tons of structurals for five federal bridges in Whatcom county, Lindstrom & Feigenson, Portland, Oreg., general contractors. The same fabricators have taken 100 tons additional involved in several small equipment jobs.

Washington Iron Works, Seattle, has completed a cable reel for the Pacific Telephone & Telegraph Co., Seattle, weighing 65 tons. The same plant also has the contract for a 60-ton boiler for the Oregon state prison.

Bids were opened this week and referred to Washington for a water system at Ft. Lewis, Wash., involving 264 tons of 4, 6 and 10-inch cast iron pipe. Pacific States Cast Iron Pipe Co., Provo, Utah, is reported to have received the contract for 77 tons of precaulked cast iron for the Taholah Indian reservation, Washington. The project also involves a 50,000-gallon steel tank.

Despite small turnover, warehouse and mills prices remain fairly firm. Bars and structurals are steady at 2.10c, mill, but plates, nominally, 2.00c, are rather weak and 1.85c has been done. Nails are unusually low. Sheets have also developed weakness, being off generally about 15 cents. The scrap markets show no change.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Feb. 2

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON	£ s d		£ s d	£ s d
Foundry, 2.50-3.00 Silicon	$ 9.95	2 18 6	$8.27	1 14 0
Basic bessemer	9.35	2 15 0*	6.57	1 7 0
Hematite, Phos. .03-.05	10.03	2 19 0	.....	.....
SEMI-FINISHED STEEL				
Billets	$16.58	4 17 6	$9.98	2 1 0
Wire rods, No. 5 gage	25.50	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$26.35	7 15 0	$26.77	5 10 0
Merchant bars	.99c	6 10 0	.53c	2 8 0
Structural shapes	1.12c	7 7 6	.46c	2 1 6
Plates, †¼ in. or 5 mm	1.29c	8 10 0	.66c to .69c	3 0 0 to 3 2 6
Sheets, black, 24 gage or 0.5 mm.	1.29c	8 10 0	1.24c	5 12 6
Sheets, gal., 24 gage, corr.	1.60c	10 10 0	1.49c	6 15 0
Bands and strips	1.18c	7 15 0	.74c to .77c	3 7 6 to 3 10 0
Plain wire, base	1.41c	9 5 0	1.18c	5 7 6
Galvanized wire, base	1.67c	11 0 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	1.67c	11 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 2.72	0 16 0	$3.20	0 13 2

British ferromanganese $68 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d	French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$ 9.95	2 18 6	$ 8.02	205	$ 8.20	295	$14.99	63
Basic bessemer pig iron	9.18	2 14 0*	6.26	160	7.78	280	16.53	69.50
Furnace coke	2.30	0 13 6	4.85	124	3.06	110	4.57	19.20
Billets	17.00	5 0 0	14.47	370	10.15	365	22.96	96.50
Standard rails	1.25c	8 5 0	1.25c	697	1.50c	1,150	1.37c	127
Merchant bars	1.03c	6 15 0	.95c	530	.62c	480	1.19c	110
Structural shapes	1.33c	8 15 0	.99c	550	.62c	480	1.16c	107.50
Plates, †¼-in. or 5 mm.	1.33c	8 15 0	1.17c	650	.75c	580	1.37c	127
Sheets, black	1.44c	9 10 0‡	1.44c	800‡	.91c	700‡	1.56c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	1.79c	11 15 0	2.43c	1,350	1.69c	1,300	4.00c	370
Plain wire	1.41c	9 5 0	2.03c	1,130	1.69c	1,300	1.92c	178
Bands and strips	1.44c	9 10 0	.90c	500	.81c	625	1.37c	127

*Basic †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price.
British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel.

STEEL, WROUGHT AND CAST IRON PIPE, AND TUBING

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pittsburgh and Lorain, O., to consumers in carloads, Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel In.	Blk.	Gal.	Iron In.	Blk.	Gal.
¼ & ⅜	57	34	½	28	10½
½	62	49½	¾	33	16½
¾	65½	55	1—1¼	36	20½
1—3	67½	57	2	38	21

LAP WELD

2	61	50½	2	26	12½
2½ to 6	64½	54	2½—3½	33	18½
8	62	51	4—6	35	22
10	60	49	7—8	34	21½
12	59	48	9—12	31	16½

BUTT WELD

Extra strong, plain ends

⅛	48	33	¼ & ⅜	+7 +41
¼ & ⅜	53½	38½	½	28 12½
½	59	49½	¾	33 17½
¾	63½	54	1—2	39 23

LAP WELD

Extra strong, plain ends

2	59	49½	2	34 18½
2½ to 4	62½	53	2½—4	39 25
5 & 6	62	52½	4½—6	38 24
8	58	47	7 & 8	36 22
10	51½	40½	9—12	26 13½
12	50½	39½		

STEEL LINE PIPE

2 to 3 butt	66½	2½ to 6 lap	63½
2 lap	60	8 lap	61
10 lap	59	12 lap	58

Discounts on steel pipe are net and not subject to any point or preferential. On iron pipe, the discounts are net.

BOILER TUBES

Carload discounts, f.o.b. Pittsburgh

Lap Welded Steel		*Charcoal Iron*	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¾—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Quantity discounts same as for hot rolled, in next column. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES COLD DRAWN

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2——2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Quantity discounts are: Under 10,000 pounds, 10 points and 5 per cent; 10,000 to 24,999 pounds, 6 points and 5 per cent; 25,000 pounds to carload, 2 points and 5 and 5 per cent; carload and over, base discount and 5 and 5 per cent. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill discounts

Random lengths over 5 ft. 55%
Selected lengths, 1—18 ft. 53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir. .....$32.00 to 33.00
Four-inch, Birmingham .... 35.00 to 36.00
Four-inch, Chicago ..... 43.40 to 44.40
Six to 24-inch, Chicago..... 40.40 to 41.40
Six-inch and over, N. Y..... 32.00 to 34.50
Four-inch, New York ..... 34.50 to 36.50
Stand. fittings, Bir. base.... $90.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch plus $20; gas pipe fittings, $5 higher. Class A pipe $3 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

(All Philadelphia prices subject to quantity differentials except reinforcing and Swedish bars)

STEEL BARS

Baltimore*	2.35c
Boston††	2.90c
Buffalo	2.95c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.40c
Los Ang.	3.30c
New York‡(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.60c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS

Baltimore	2.35c
Boston††	3.10c
Buffalo	3.15c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia	2.45c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS

Baltimore	2.35c-3.00c
Boston	3.10c-3.25c
Buffalo	2.95c
Chattanooga	3.00c
Cincinnati	3.00c
Cleveland	2.10c-2.25c
Detroit	2.85c
Houston	3.00c
Los Ang. cl...	2.10c
Los Ang., lcl	2.40c
New York	2.65c-3.10c
Phila.	2.62½c
Pittsburgh	2.50c
San Fran. cl.	2.40c
San Fran. lcl	2.80c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore*	2.35c
Boston††	3.00c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	2.65c
Los Ang.	3.30c
New York(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

PLATES

Baltimore*	2.35c
Boston††	3.00c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New York(d)	3.30c
Philadelphia	2.45c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE

Baltimore*	2.80c
Boston††	2.90c-3.00c
Buffalo	3.10c-3.25c
Chattanooga	3.50c
Chicago	2.75c-2.90c
Cincinnati	3.05c
Cleveland	3.00c
Detroit	2.90c-3.05c
Houston	3.35c
Los Ang.	3.60c
New York	3.00c
Portland	4.00c
Phila.*† (e)	2.90c
Pitts.**	3.00c
San Fran.	3.50c
Seattle	4.00c
St. Louis	3.00c-3.15c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK

Balt.*†	3.50c
Boston††	3.85c
Buffalo	3.70c
Chattanooga	3.65c
Chicago	3.45c
Cincinnati	3.50c
Cleveland	3.25c
Detroit	3.50c
Los Ang.	4.20c
New York	3.25c
Phila.*†(e)	3.40c
Pitts.**	3.20c-3.40c
Portland	4.50c
San Fran.	3.90c
Seattle	4.50c
St. Louis	3.70c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS

Balt.*†	4.00c
Buffalo	4.00c
Boston††	4.05c
Chattanooga	3.95c
Chicago	3.50c-3.75c

††Base 15,000 lbs., extras on less.

Cincinnati	3.90c
Cleveland	3.75c
Detroit	3.75c
Houston	3.57c
Los Ang.	4.50c
New York	3.75c
Phila.*†(e)	3.75c
Pitts.**	3.90c
Portland	5.00c
San Fran.	4.55c
Seattle	5.00c
St. Louis	4.00c
St. Paul	4.19c
Tulsa	5.10c

†BANDS

Baltimore	2.65c
Boston††	3.40c
Buffalo	3.30c
Chattanooga	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	2.85c
Los Ang.	3.80c
New York(d)	3.30c
Philadelphia	2.75c
Pittsburgh	2.95c
Portland	3.85c
San Fran.	3.15c
Seattle	3.50c
St. Paul	3.20c
Tulsa	3.45c

†HOOPS

Baltimore	2.65c
Boston	4.90c
Buffalo	3.95c
Chicago	3.50c
Cincinnati	3.75c
Det. No. 14 & lighter	3.30c
New York	3.30c
Philadelphia	3.00c
Pittsburgh	3.60c
Seattle	5.00c
St. Paul	3.75c

†New extras apply.

COLD FIN. STEEL

Rounds and Hexagons

Baltimore (c)*	3.48c
Boston	3.60c
Buffalo	3.00c
Chattanooga*	3.65c
Chicago	3.00c
Cincinnati	3.32c
Cleveland	2.95c
Detroit	3.15c
Los Ang. (a)	4.25c
New York(g)	3.54c
Pittsburgh	2.95c
Portland (a)	4.50c
San Fran(d)(f)	5.55c
Seattle (a)	4.50c
St. Paul (a)	3.20c
St. Louis	3.36c
Tulsa	4.65c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted.

Phila. bar base 3.35c

COLD ROLL. STRIP

Boston 0.100 in., 500 lb. lots	5.20c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(a) Rounds, hex. only.
(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) Bessemer analysis extras included.
‡Domestic bars.
*Plus quan. extras.
**Less than 25 sheets.
*†50 or more bundles.

Here and There in Industry

LUKENS STEEL CO., Coatesville, Pa., has opened a sales office for southeastern territory in the Citizens & Southern National Bank building, Atlanta, Ga. It is in charge of Adolph Rider Jr., manager of sales. Two years ago the company moved its district headquarters from Atlanta to New Orleans, closing the office in the former city.

□ □ □

Walter-Wallingford & Co., Cincinnati, pig iron, coke and alloys, moved Feb. 1 from the Traction building to offices in the Carew Tower.

□ □ □

Machine Tool & Supply Co., Tulsa, Okla., has moved to new and larger quarters at 215-17 East Second street. L. L. Dresser is president and Jack Manchester is manager.

□ □ □

Williamsport Wire Rope Co., Williamsport, Pa., has been licensed by the American Cable Co., New York, to manufacture preformed wire rope under the latter's patents.

□ □ □

Kelly-Decker Co., 39 Cortlandt street, New York, dealer in coke and limestone, has changed its name to Kelly-Bates Co. The company now is composed of A. E. Kelly and R. D. Bates.

□ □ □

Scullin Steel Co., St. Louis, has elected E. F. Judge, secretary, as a director, succeeding A. J. Davis, who has resigned as vice president and director, devoting his time to the A. J. Davis Instrument Co. and the Manufacturers Transportation association, of which he is chairman.

□ □ □

Scully-Jones & Co., 1901 South Rockwell street, Chicago, manufacturer of production tools, have acquired the American Specialty Co., Chicago, manufacturer of sleeves and sockets.

□ □ □

Northfield Iron Co., Northfield, Minn., has elected C. L. Brown president and general manager, J. D. Nutting vice president and A. T. Peterson secretary and treasurer.

□ □ □

Hannum Mfg. Co., 634 West Keefe avenue, Milwaukee, manufacturer of automotive steering gears, is changing its name to Lavine Gear Co., by which it was originally known. George H. Hannum, Detroit, who became president several years ago, is no longer with the company and Herman A. Uihlein has resumed the general management.

□ □ □

Moore-Handley Hardware Co., Birmingham, Ala., has placed a contract with Link-Belt Co., Chicago, for two carloads of Link-Belt chains, conveying and power transmission machinery.

□ □ □

United Machine Works, Fort Worth, Tex., has been organized as the successor of G. W. Mennis Machine Works, 2005 Montgomery street, Fort Worth. Leon L. Sanders and G. C. Street are owners.

□ □ □

Lake Shore Engine Works, Marquette, Mich., manufacturer of mining machinery, has established a branch at Sault Ste. Marie, Ont., using the plant of the Northern Foundry & Machinery Co.

□ □ □

Foote Bros. Gear & Machine Co., Chicago, has appointed William E. Peck as successor to Ralph Wirth as sales representative in Indiana except the counties of Lake, Porter and Laporte, and Ohio river towns.

□ □ □

Uddeholm Co. of America Inc., 155 East Forty-fourth street, New York, has appointed Austin-Hastings Co. Inc. its distributor in New England for its Swedish tool steels. Warehouses are at Cambridge, Mass., and Worcester, Mass.

□ □ □

Wilson & Bennett Mfg. Co., Chicago, has leased quarters for its New Orleans branch at Bienville and North Cortez streets and has installed new machinery for the manufacture of steel barrels. R. L. Hurd is branch manager and John Van Dyke is plant superintendent.

□ □ □

J. K. Welding Co. Inc., 138 Center street, New York, J. A. Klevens president, has leased a new plant of 10,000 square feet at 43 Thirty-seventh street, Queens, N. Y., to meet increased demand for space. A bending roll h s been bought to handle the company's plate work and other equipment will be acquired. The plant in Manhattan will be continued in operation.

□ □ □

All American Steel Products Co. Inc., Balfour building, San Francisco, has been organized to distribute products of American steel mills and manufacturers exclusively. Offices will be opened shortly at Los Angeles and Seattle. Arnold Foster is president. He formerly was in charge of sales on the Pacific coast for the Bethlehem Steel Co. and for the past three years has been vice president in charge of sales for the Bethlehem Steel Co. and the Pacific Coast Steel Corp.

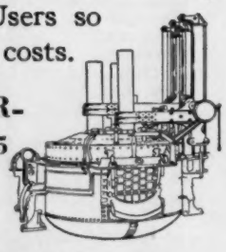
□ □ □

Timken Steel & Tube Co., Canton, O., has appointed the Delaware Steel Services Inc. its exclusive represen-

Lectromelt

direct arc melting and refining furnaces for tool and alloy steel ingot production, for steel castings manufacture, ... and the making of plain steels as are used in the Lectromelt billet size ingot process for reinforcing bars . . . . have now been made even more rapid and economic by the new patent . . .

LIFT and SWING-ROOF, QUICK-TOP-CHARGE DESIGN . . . . This construction may be seen in use in the field . . . . Users so fitted have proved this feature lowers costs.



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and associate company

CANADIAN LECTROMELT FURNACES LTD. . . . . 4295 Richelieu St., Montreal, P. Q., Canada

SIZES - - - 50 Pounds to 50 Tons Capacity

tative in the Philadelphia district. The latter company has offices and warehouse at 1614 Summer street, Philadelphia. It is composed of Gustaf Peterson and Stuart B. Mathews, formerly of the Ludlum Steel Co., and G. F. Wilson, formerly of Associated Alloy Steel Co.

□ □ □

Dietcher Bros. Ltd., Montreal, has collected at St. John, N. B., about 4750 tons of used steel rails of 50 to 70 pounds per yard, which have been replaced by heavier rails by the Canadian National railway. The rails have been sold for shipment to Japan.

□ □ □

Buffalo Tank Corp., Buffalo, has acquired the tank and plate fabricating plant of the United Dry Dock Corp., New York, located on Staten Island. The plant has a capacity of about 15,000 tons of fabricated plate work per year. No change is made in officers of the Buffalo Tank Corp., and no new capital is required. The plant is adequately equipped and no additional tooling will be necessary.

□ □ □

Babcock & Wilcox Co., 85 Liberty street, New York, has formed a new department to handle sales of cement mill equipment and pulverizing machinery, in charge of E. H. Fromm, New York. H. B. Smith will handle eastern territory from the New York office, J. G. Burke in Atlanta, Ga., H. G. Barnhurst at Chicago and G. C. Barnaby in San Francisco for the Pacific Coast.

□ □ □

Norton Co., Worcester, Mass., has appointed Crane-Schiefer-Owens Inc., with offices in Buffalo, Syracuse and Rochester, N. Y., its representative in those districts for sale of Norton grinding, lapping and balancing machines. C. H. Hill, for many years associated with sale and demonstration of Norton machines in this territory, is now connected with Crane-Schiefer-Owens Inc.

□ □ □

Harry S. Braman, 1508 Central Tower building, Youngstown, O., represents the Standard Alloy Co. Inc., Cleveland; Superior Bronze & Aluminum Co., Warren, O.; Standard Fuel Engineering Co., Detroit. His lines cover heat and acid-resisting castings, brass, bronze, copper and aluminum castings and refractory specialties.

Mirrors of Motordom

(*Continued from Page* 17)

the gasoline tank will be back under the cowl, eliminating the fuel pump, the water pump will be eliminated in favor of a thermo-syphon system, and brake rods will be eliminated.

This smaller car is believed to be closed to Mr. Ford's heart than the larger one, because it will be extremely low priced, in a field he has regarded as his own.

Extensive experiments have been conducted at the Dearborn laboratories recently on cast crankshafts, It is said that the desirable tensile strength has been attained, but at the expense of a degree of hardness which would compel the almost total substitution of grinding for machining.

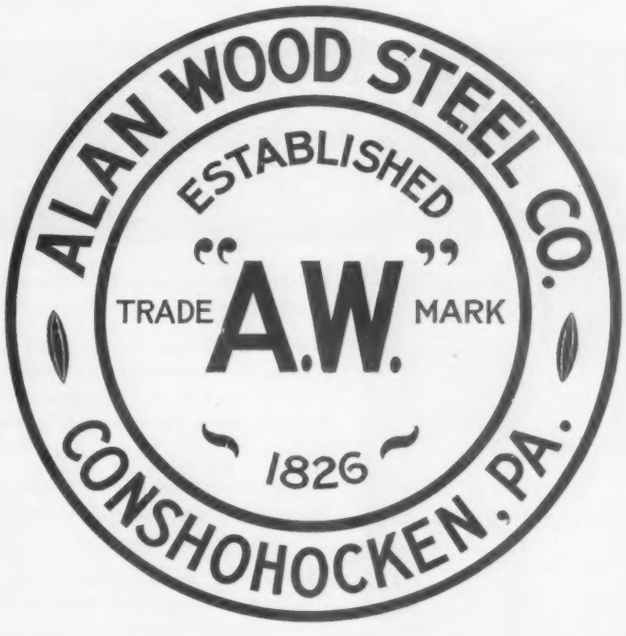
Thus far the retail low-price market has been a virtual landslide for Chevrolet. December production was about 33,000 units, final returns for January place the month's total at 60,000 to 62,000 units, and with an additional authorization last week of 10,000 units it would appear that February assemblies will come close to equalling those of January.

Chevrolet, meanwhile, continues to get its new Mercury line ready for introduction. Speculation on the announcement ranges from Feb. 15 to the time when the smaller Ford is ready. The first run on Mercury is expected to be about 7500. Indications are that this line will have a wheelbase of about 100 inches, it will be a six with an engine having a stroke 1 inch shorter than the present line, probably priced at about, $350, Detroit, or in the class of the small Ford, Willys four and Continental four.

Carbon and Alloy Steels
Blue Annealed Sheets,
Sheared Plates: also Billets.

Rolled Steel Floor Plates
Diamond, Diamondette and Ribbed Patterns

Swede Pig Iron
Rainey-Wood Coke



ALAN WOOD STEEL CO.
CONSHOHOCKEN, PA.

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Seattle	San Francisco	Houston

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

MT. CARMEL, CONN.—Benjamin Stewart & Sons Inc. has started operations in the plant of the former Mt. Carmel Bronze & Brass Foundry Co. and will engage in nonferrous casting, production and jobbing.

AMESBURY, MASS.—Amesbury Metal Products Co., recently organized, has taken over the plant of the Aga Auto Lamp Co. and will operate a machine shop for brass work and spinning, stamping and finishing departments.

New Jersey

JOHNSTOWN, PA.—Boiler house in the East Conemaugh yards of the Pennsylvania railroad suffered damage estimated at $50,000 by fire recently.

PITTSBURGH—M. W. Singer & Co. has been incorporated with $5000 capital to operate a scrap steel and iron business, by J. W. Singer, 5541 Woodmont street, Pittsburgh.

PITTSBURGH—Valley Camp Coal Co., Cleveland, is completing rebuilding of its coal-handling equipment at its Lilley mine, Brownsville, Pa., on the Monongahela river.

PITTSBURGH—Main plant of the Neville Co., Neville island, Pittsburgh, was destroyed by fire Jan. 30. The plant produced tar and principal damage was to machinery for mixing tar and gravel and to the main building. Loss is estimated at $100,000.

WESLEYVILLE, PA.—Thomas Engineering Corp., G. V. Thomas president, has bought the plant and facilities of R. E. Byrd, maker of die-casting equipment, and will manufacture and market die-casting machines and die castings.

Ohio

CLEVELAND—Central Iron & Metal Co. has been incorporated with 100 shares no par value to conduct a scrap iron and metal business, by Albert M. Spero, 722 Leader building, Cleveland.

Michigan

DETROIT—Keystone Refining Co., 12800 Northampton avenue, plans repairs to its plant to cost $25,000.

DETROIT—Central Bolt & Nut Co., 1155 Bellevue street, has been incorporated with $15,000 capital to manufacture bolts, nuts and similar products.

DETROIT—Majestic Stamping Co. has been incorporated with $12,000 capital to manufacture metal stamped goods, by Charles W. Walters, 9310 Hubbell avenue, Detroit.

DETROIT—Blanck & Gargaro Inc., Detroit, is low at $17,845 for construction of a pumping station at Ford and Southfield roads for the department of public works.

DETROIT — Mechanical Laboratories Inc. has been incorporated with $10,000 capital and 120 no par shares to design and manufacture mechanical devices and machinery, by D. R. Mitchell, 3137 Book Tower, Detroit.

DETROIT—Pin Lock Corp., 2049 Union Guardian building, has been incorporated with $30,000 capital to manufacture mechanical accessories, by Chester C. Harbridge, 2933 Second avenue.

LUDINGTON, MICH.—A report has been made by Burns & McDonnell Engineering Co., 406 Interstate building, Kansas City, Mo., recommending building of an electric light and power plant by the city at estimated cost of $337,200. Action by the city is expected soon.

ROYAL OAK, MICH.—Kimball Mfg. Co. Inc., 1712 Roseland avenue, has been incorporated with $50,000 capital to manufacture cutting tools for fibrous materials, by Clarence M. Kimball, 1712 Roseland avenue, Royal Oak, Mich.

ST. CLAIR, MICH.—Electric Units Inc. has been incorporated with $50,000 capital to manufacture stoves, heaters and electrical appliances, by James Isbister, North Riverside avenue, St. Clair, Mich.

Indiana

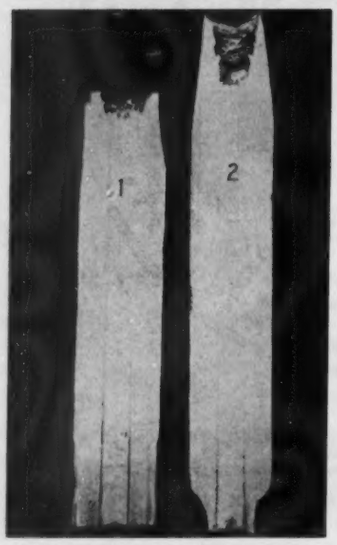
FORT WAYNE, IND.—Charles R. Wermuth & Sons, Birmingham, Mich., are low bidder on the dam and pumping station to be erected here, at $244,072.

INDIANAPOLIS—American Utilities Corp., R. E. Stevenson president, 824 Continental Bank building, plans construction of hydroelectric plant on the Eel river, Owen, county, Indiana, to cost about $2,000,000.

Illinois

BELLEVILLE, ILL.—Empire Stove Co. has been formed with $30,000 capital and will engage in the manu-

Let LIQUITOL Reduce YOUR INGOT COSTS



(1) Is treated with LIQUITOL A SPECIAL, the fluid metal is only poured to half of the head. The formation of the hole is such that the ingot is quite solid. The savings in 16 of these ingots is 1 ingot. This is only used for refined steel, that is to say, tool steel, cutting steel, and special steels of high quality.

LIQUITOL retards Cooling of hot-top metal.

Working on the theory that secondary piping is caused by occluded gases, it follows that if the hot-top is kept open longer gases have a better chance to escape.

Liquid metal in the hot-top allows for proper feeding and reduction in hot-top volume up to 40%.

LIQUITOL is recommended in production of alloy steel, as it is guaranteed not to contaminate metal.

LIQUITOL prevents bridging of hot-top metal, allowing a natural feed of metal down the hot-top sides.

THE ALPHA-LUX COMPANY, INC.

192 Front Street
NEW YORK CITY

Philadelphia Chicago

facture of stoves and operate a foundry business.

CAIRO, ILL.—Cairo Mfg. Co., Upper Sycamore street, has been incorporated with 1000 shares no par value to manufacture filling station equipment, by Dewey & Cummins, 800 Commercial avenue, Cairo, Ill.

CHICAGO—Wilson & Co., 4100 South Ashland avenue, plans replacement of a boiler and machinery in its packing plant.

CHICAGO—Sears, Roebuck & Co., Arthington and Homan avenues, plan a boiler plant addition to cost $250,000. M. Roberts is chief engineer, in charge of the improvement.

CHICAGO — Harris Preble Fire Doors Inc., 4608 West Twentieth street, has been incorporated with $10,000 capital to manufacture steel and iron products, by Klein & Lasky, 188 West Randolph street.

CHICAGO—Chicago Safety Device Co., 1208 Hood street, has been incorporated with 200 shares no par value to manufacture automobile accessories, by David T. Shipman, 77 West Washington street.

CHICAGO—Andel & Co., 4630 North Damen avenue, has been incorporated with $40,000 capital to manufacture mechanical equipment and machinery, by Fullenkamp & Hutchins, 100 North LaSalle street.

CHICAGO—American Expansion Bolt & Mfg. Co., 108 North Jefferson street, has been incorporated to manufacture hardware specialties, by J. Warren Isett and associates. F. A. Campbell, 3254 Michigan avenue, is correspondent.

CHICAGO—Harris Preble Fire Doors Inc., 4608 West Twentieth street, has been incorporated with $10,000 capital to manufacture steel and iron products, by Kenneth J. Preble and associates. Klein & Lasky, 188 West Randolph street, are correspondents.

CHICAGO—International Rolling Mills Products Co., 3136 West Fifty-first street, has been incorporated with $20,000 capital to deal in steel and iron and their products, by W. Russell Arrington and associates.

Southern States

SULLIGENT, ALA.—City plans construction of a pumping plant and waterworks distribution system. R. E. Totten, Homewood station, Birmingham, Ala., is engineer.

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids until Feb. 14, as follows: Schedule 9539, one motor-driven power press, for San Diego, Calif.; schedule 9547, one motor-driven universal table saw, for Portsmouth, N. H. Until Feb. 21, schedule 9548, one bench and floor stand press, for Mountain View, Calif.; schedule 9551, two motor-driven engine lathes, for Mare Island, Calif.

LOUISVILLE, KY.—Hoffman Gas & Electric Heater Co. has been organized and has bought the business and plant of the Hoffman Heater Co. It plans to increase production of gas and electric heaters. W. H. Bowman Jr. is president.

BALTIMORE—Mexican Petroleum Co., Wagners Point, Baltimore, is building the first unit of a refinery, including cracking units of 25,000 barrels daily capacity, to cost $500,000. Total plant eventually will represent an investment of $4,500,000.

GREENSBORO, S. C.—Cone Mills, B. M. Cone president, has plans by J. E. Sorrine & Co., engineers, Greenville, for a power plant and textile mills to cost over $50,000. Engineers will buy equipment. One 3000 and one 1000 kilowatt turbine have been let to the General Electric Co. and a boiler to the Babcock & Wilcox Co., New York.

EAST RADFORD, VA.—Appalachian Power Co. is planning construction of a hydroelectric project on New river, near here, to contain 26,000-horsepower generators and to cost $12,000,000 complete.

Arkansas

MENA, ARK.—G. W. Petty heads a committee planning for erection of an electric light and power plant.

Texas

HOUSTON, TEX.—Continental Can Co., 1 Pershing square, New York, M. R. Federly in charge, has postponed bids until late in March for a can manufacturing plant here.

HOUSTON, TEX.—General Metallizing Co. of Texas has been incorporated by George W. Fowler, manager, and has established a plant at 406 La Branch street, for applying metal finishes by means of a blow torch and compressed air.

Wisconsin

OSHKOSH, WIS.—Oshkosh Foundry Co. has been incorporated with $25,000 capital to conduct a general castings and foundry business by H. Steuck and associates.

RACINE, WIS.—Morris Waisman Co. has been incorporated with 200 shares no par value to deal in steel, iron and nonferrous metals, by Morris S. Waisman and associates.

SUPERIOR, WIS.—Northern Pacific railroad is spending $75,000 in improvement of its docks, including complete overhaul of loading and conveying equipment.

WAUSAU, WIS. — Johnson Piston Ring Co. has been incorporated with $25,000 capital to manufacture piston rings and other replacement parts for gasoline engines, by S. Johnson and associates.

Iowa

VILLISCA, IOWA—City of Villisca has voted to build a municipal electric light and power plant to cost about $150,000.

Kansas

BURLINGTON, KANS.—C. S. Wingett, mayor, has retained E. T. Archer, 609 New England building, Kansas City, Mo., as engineer to prepare plans for a municipal electric light and power plant.

Colorado

COLORADO SPRINGS, COLO.—City council, E. L. Mole manager, has budgeted $84,000 for completing its steam plant and for additions and betterments in the electric lighting plant.

Nevada

BOULDER CITY, NEV.—Six Companies Inc. has the contract for building an assembly plant at Bechtel, Nev., for the Babcock & Wilcox Co., New York, to be used for assembly of steel pipe for penstock tunnels for Hoover dam. Plant will be 85 x 670 feet and 55 feet high. Cost will be about $90,000.

Idaho

AFTON, IDAHO—C. J. Call, Pocatello, Idaho, is having plans made for a hydroelectric plant on Swift creek to supply this village and vicinity with electric power.

Pacific Coast

ALAMEDA, CALIF.—Burns-McDonnell-Smith Engineering Corp., Western Pacific building, Los Angeles, has returned a recommendation that the city build an electric power plant, capacity 15,000 kilowatts, steam, at $1,000,000, or diesel-electric at $1,350,000.

LOS ANGELES—Flexo Mfg. Co. has moved to 1700 Ninth street where it occupies 40,000 square feet of floor space for the manufacture of radiators, condensers and ice machinery parts. C. H. Wentworth is manager.

OAKLAND, CALIF.—Lasco Brake Products Co., Twenty-sixth and Magnolia streets, plans improvements in its plant and installation of new machinery. Cost is estimated at about $75,000.

SAN DIEGO, CALIF.—Aztec Brewing Co. has purchased the plant of the Savage Tire Co. and will equip a brewery in readiness for change in prohibition laws. Richard Grieser, Chicago, is architect and engineer and is making plans.

SAN FRANCISCO—Standard Oil Co. (Calif.), 225 Bush street, plans extensions of its natural gas pipe lines from the Kettleman Hills district into Oregon and Washington.

SAN FRANCISCO—John A. Roebling's Sons Co. of California plans erection of a plant in which to build cable

WHERE-TO-BUY

A classified list of advertisers according to products. ¶Index to advertisements gives page number of any advertiser.

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AIR COMPRESSORS—See COMPRESSORS (Air)

ALLOYS—See FERROALLOYS

ANGLES, CHANNELS—See BEAMS, CHANNELS, ANGLES

ARBORS
Morse Twist Drill & Machine Co., New Bedford, Mass.

AXLES
Bethlehem Steel Co., Bethlehem, Pa.
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Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
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Tennessee Coal Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.

BABBITT METAL
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

BALING PRESSES
Logemann Brothers Co., 3126 Burleigh St., Milwaukee.

BANDS (Iron and Steel)
Acme Steel Co., 2840 Archer Ave., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Republic Steel Corp. Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

BANDS—See HOOPS AND BANDS

BAR BENDERS
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

BARGES (Steel)
American Bridge Co., Frick Bldg., Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
McClintic-Marshall Corp., Bethlehem, Pa.

BARS (Alloy)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Timken Steel & Tube Co., Canton, O.

BARS (Concrete Reinforcing)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 S. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Youngstown Sheet & Tube Co., Youngstown, O.

BARS (Iron)—See IRON (Bar)

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

BEAMS, CHANNELS, ANGLES, ETC.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

BEARINGS (Ball)
Bantam Ball Bearing Co., The, South Bend, Ind.

BEARINGS (Bronze)
Shenango-Penn Mold Co., Dover, O.

BEARINGS (Journal)
Bantam Ball Bearing Co., The, South Bend, Ind.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Roller)
Bantam Ball Bearing Co., The, South Bend, Ind.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Thrust)
Bantam Ball Bearing Co., The, South Bend, Ind.
Timken Roller Bearing Co., The, Canton, O.

BENDING AND STRAIGHTENING MACHINES
Alliance Machine Co., The, Alliance, O.
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Logemann & Bros. Co., 3126 Burleigh St., Milwaukee.
Morgan Engineering Co., The, Alliance, O.
Thomas Spacing Machine Co., Pittsburgh, Pa.

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Construction Co., 1301 Koppers Bldg., Pittsburgh.
Youngstown Sheet & Tube Co., Youngstown, O.

BILLETS (Alloy and Carbon Steel)
Alan Wood Steel Co., Conshohocken, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. La Salle St., Chicago, Ill.
Republic Steel Corp., Youngstown, O.
Timken Steel & Tube Co., Canton, O.
Washburn Wire Co., Phillipsdale, R. I.

BILLETS (Forging)
Alan Wood Steel Co., Conshohocken, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Timken Steel & Tube Co., Canton, O.

BILLETS AND BLOOMS
Alan Wood Steel Co., Conshohocken, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Timken Steel & Tube Co., Canton, O.
Youngstown Sheet & Tube Co., Youngstown, O.

BLAST FURNACE SPECIALTIES
Bailey, Wm. M., Co., 702 Magee Bldg., Pittsburgh, Pa.

BLAST FURNACES—See FURNACES (Blast)

BLOWERS
General Electric Co., Schenectady, N. Y.
Strong, Carlisle & Hammond Co., The, 1394 W. 3rd St., Cleveland, O.

BOILER HEADS
Bethlehem Steel Co., Bethlehem, Pa.

BOILER TUBES—See TUBES (Boiler)

BOLTS
Bethlehem Steel Co., Bethlehem, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Jones & Laughlin Bldg., Pittsburgh, Pa.
Oliver Iron & Steel Corp., S. 10th & Muriel Sts., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Ryerson, Jos. T., & Son, Inc. 16th and Rockwell Sts. Chicago Ill.

BOLT AND NUT MACHINERY
Landis Machine Co., Waynesboro, Pa.

BOXES (Annealing)
United Engineering & Fdry. Co., First National Bank Bldg., Pittsburgh, Pa.

BOXES (Case Hardening)
Strong, Carlisle & Hammond Co., The, 1394 W. 3rd St., Cleveland, O.

BOXES (Open Hearth Charging)
Morgan Engineering Co., The, Alliance, O.
Wellman Engineering Co. 7000 Central Ave., Cleveland, O.

BRAKES (Electric)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

BRICK (Fire Clay)
Eureka Fire Brick Works, 1015 House Bldg., Pittsburgh, Pa.
Strong, Carlisle & Hammond Co., The, 1394 W. 3rd St., Cleveland, O.

BRICK (Silicon Carbide)
Norton Co., Worcester, Mass.

BRIDGE CRANES (Ore and Coal Handling)
Alliance Machine Co., The, Alliance, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

BRIDGES, BUILDINGS, VIADUCTS, STACKS
American Bridge Co., Frick Bldg., Pittsburgh, Pa.
Belmont Iron Works, 22nd and Washington Ave., Philadelphia, Pa.
International Stacey Corp., Columbus, O.
McClintic-Marshall Corp., Bethlehem, Pa.
Ohio Structural Steel Co., The, Newton Falls, O.
Truscon Steel Co., Youngstown, O.

BUCKETS (Clam Shell, Dragline, Grab, Single Line)
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.
Harnischfeger Corp., 411 W. National Ave., Milwaukee, Wis.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

for the Golden Gate bridge, for which it has the contract. The estimated cost of the plant is $330,000.

SAN FRANCISCO—Pelton Water Wheel Co., Nineteenth street, has been awarded a contract by the Los Angeles water district for six butterfly valves and one sluice gate complete for San Gabriel dam No. 2 at Azusa, Calif., at $23,493.

WHITTIER, CALIF.—Bonds for $100,000 for watermains and other improvements were defeated at a recent election.

KLAMATH FALLS, OREG.—Citizens of Bonanza, Wash., and vicinity have revived proposal to build common carrier railroad from Dairy, Wash., into a virgin timber district, at cost of about $200,000. W. F. B. Chase, county commissioner, Klamath Falls, is interested.

LONGVIEW, WASH.—Union Oil Co. of California, Union Oil building, Los Angeles, plans to add a pressure distillate sterilizer at its plant here, to cost about $58,000.

SPOKANE, WASH. — Columbia Pump & Engineering Corp., P. H. Williams president, has bought the former plant of the Colfax Draper Co. and the adjoining works of a thresher concern on a tract of 1½ acres, including a foundry, machine shop, storage and stock rooms. The plants will be converted into a pump factory and equipment installed at once.

TACOMA, WASH.—Approval by the war department has been received for the proposed Narrows bridge and testing for foundations is under way. The bridge is planned for a total length of 5000 feet, with a main span of 1200 feet and six spans of 600 feet each. Total cost is estimated at $3,000,000.

Dominion of Canada

VICTORIA, B. C.—Canadian Diatomite Ltd., 517 Sayward building, is building a plant at Point Ellice, including factory, wharf and other structures. William Calder is general contractor.

PORT CREDIT, ONT.—Lloyd Refining Co., L. B. Lloyd, Toronto, president, has bought a site and will build a refinery with capacity for 1500 barrels daily. Tanks with capacity for 5,000,000 gallons will be included.

TORONTO, ONT.—Wheel foundry of the Canadian Car & Foundry Co., Amherst plant, will operate the next month on an order from the Canadian National railways for 1000 wheels for stock purposes.

WELLAND, ONT.—Part of the plant of the Page-Hersey Tube Co., Welland, has been reopened and nearly 400 employes will return to work shortly.

WOODSTOCK, ONT.—Woodstock Public Utilities Commission plans a survey on advisability of building a municipal central heating plant. J. G. Archibald, manager for the commission, and W. G. Ure, city engineer, are interested.

New Trade Publications

EXPANSION JOINTS—Yarnall-Waring Co., Philadelphia, in bulletin EJ-1904 illustrates and describes its cylinder-guided expansion joint, of wrought steel, to suit the steel pipe lines on which they are used. Method of repacking joints under pressure is described.

ROLLER HEARTH FURNACES—W. S. Rockwell Co., 50 Church St., New York, in bulletin No. 335 describes electric and fuel fired roller hearth furnaces for continuous heat treatment of metals. Various features of the equipment are described.

STAINLESS STEEL — Electro Metallurgical Co., Carbide & Carbon building, New York, has published a booklet on stainless steels and their uses. The booklet is illustrated by reproductions of photographs showing the stainless steel in use.

WIRE MACHINERY—Sleeper & Hartley Inc., Worcester, Mass., has issued a looseleaf catalog of its spring-making, continuous wire-drawing, wire nail and wire mill equipment. Full data are given and illustrations are plentiful.

STAINLESS WELDED TUBE—A bulletin by the Carpenter Steel Co., 100 Broadway, New York, welded alloy tube division, has illustrations of varieties of tubing and the text covers general information, physical properties and working instructions.

ELECTRIC POWER EQUIPMENT—Powercraft Corp., 2215 DeKalb street, St. Louis, has issued its first catalog, in looseleaf form, covering its commercial type equipment, 63 pages, well illustrated and filled with information on the company's goods and their application.

STEEL SHEET PILING—Carnegie Steel Co., Pittsburgh, has issued insert B for its catalog on steel sheet piling. It covers methods of determining bending moments and earth pressures, as determined by engineers of prominence. Its value to engineers using sheet piling is evident.

PORTABLE CRANE—Bucyrus-Erie Co., South Milwaukee, Wis., has published a 20-page bulletin illustrating a general utility crane mounted on a tractor recently introduced. Photographs illustrate uses of the crane. Capacities, working ranges and specifications are included.

LEATHER BELTING—A leather belting with a non-skid surface which, it is claimed, gives the belt greater pulling power, smoother operation, freedom from slippage, lower ultimate operating costs and other advantages, is described in a bulletin recently issued by E. F. Houghton & Co., Philadelphia. Illustrations show application.

WIRE ROPE SLINGS—John A. Roebling's Sons Co., Trenton, N. J., presents in a current catalog, its sixth edition, a mass of information about wire rope slings and their proper use for safety and efficiency. Illustrations show the slings in action and also the accessories that add to their utility.

BOLTS, NUTS, SCREWS — Clark Bros. Bolt Co., Milldale, Conn., has issued a new catalog covering its lines of bolts, nuts and screws. It forms a handbook for users of these products, conveniently arranged and indexed. In addition to lists of these products the book covers data regarding heads, threads and weights, with illustrations showing special and odd-shaped bolts.

COMPRESSORS—Sullivan Machinery Co., Chicago, has issued a catalog on its angle compound air compressors. It describes the compressors and shows many installations of various types. Ready adaptation of this compressor type to direct motor drive is stressed. Automatic controls and adaptability to part-capacity operation are also described.

EXTENSOMETER—Linde Air Products Co., 205 East Forty-second street, New York, describes a device for measuring ultimate strength of a material without permanently altering its size or shape. This is its portable tensile testing machine. For testing more thoroughly the company's extensometer is provided for organizations without elaborate laboratory facilities. A booklet has been issued on each of these devices.

NICKEL CAST IRON—International Nickel Co., 67 Wall street, New York, has issued a 4-page leaflet containing tabulations of nickel and nickel-chromium cast iron compositions with corresponding mechanical properties for sections in thickness from ¼-inch to four inches in tensile strengths from 25,000 pounds per square inch to 48,000 pounds per square inch. Directions for use of the tables and choice of suitable compositions are included.

HYPOID GEARS—Gleason Works, Rochester, N. Y., is distributing a booklet of engineering data on large hypoid gears and spiral bevel gears, form No. 600. It is prepared for the use of the engineering and purchasing departments of gear users and contains information on design, application, efficiency, speeds and horsepower transmission of these two types of gears. Standard specifications are offered from which suitable gears can be selected for various purposes.

PUMPS—A catalog, L-10, has been issued by the DeLaval Steam Turbine Co., Trenton, N. J., describing its rotary displacement pump, designed to run at standard motor speeds and even at turbine speeds. There are only three moving parts, a power rotor and two idler rotors. The catalog lists pumps from 4 to 460 gallons per minute capacity, for pressures up to 200 pounds. Other pumps may be obtained for pressures in excess of 500 pounds per square inch.

WHERE-TO-BUY

WHERE-TO-BUY

BUILDINGS (Steel)—See BRIDGES, ETC.

BULLDOZERS
Logemann Bros. Co., 3126 Burleigh St., Milwaukee.

BURNERS (Acetylene)—See TORCHES AND BURNERS

BURNERS (Automatic)
American Heat Economy Bureau Inc., Wabash Bldg., Pittsburgh, Pa.
Wean Engineering Co., Warren, O.

BURNERS (Fuel, Oil, Gas, Combination)
Wean Engineering Co., Warren, O.

BUSHINGS (Bronze)
Shenango-Penn Mold Co., Dover, O.

BY-PRODUCT PLANTS
Koppers Construction Co., 1301 Koppers Bldg., Pittsburgh, Pa.

CARBIDE
Linde Air Products Co., 30 E. 42nd St., New York City.

CAR DUMPERS
Alliance Machine Co., The, Alliance, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

CARS (Charging)
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.
Morgan Engineering Co., The, Alliance, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

CARS (Industrial and Mining)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland.
Bethlehem Steel Co., Bethlehem, Pa.

CARS (Scale)
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.

CASTINGS (Acid Resisting)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Driver-Harris Co., Harrison, N. J.
International Nickel Co., Inc., 67 Wall St., New York City.
Shenango-Penn Mold Co., Dover, O.

CASTINGS (Alloy Steel)
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Pittsburgh Rolls Corp., 41st and Willow Sts., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
United Engineering & Fdry. Co., First National Bank Bldg., Pittsburgh, Pa.

CASTINGS (Brass, Bronze, Copper, Aluminum)
Bethlehem Steel Co., Bethlehem, Pa.
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Morgan Engineering Co., The, Alliance, O.
Shenango-Penn Mold Co., Dover, O.

CASTINGS (Electric Steel)
Pittsburgh Lectromelt Furnace Corp., P. O. Box 1125, Pittsburgh, Pa.
West Steel Casting Co., 805 E. 70th St., Cleveland, O.

CASTINGS (Gray Iron)
Bethlehem Steel Co., Bethlehem, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Roll & Foundry Co., The, Avonmore, Pa.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.
United Engineering & Fdry. Co., First National Bank Bldg., Pittsburgh, Pa.

CASTINGS (Heat Resisting)
Driver-Harris Co., Harrison, N. J.

CASTINGS (Malleable)
Peoria Malleable Castings Co., Peoria, Ill.

CASTINGS (Steel)
Allegheny Steel Co., Brackenridge, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Mackintosh-Hemphill Co., Penn Ave. at Water St., Pittsburgh, Pa.
Mesta Machine Co., P. O. Box 1124, Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Roll & Foundry Co., The, Avonmore, Pa.
Pittsburgh Rolls Corp., 41st and Willow Sts., Pittsburgh, Pa.
United Engineering & Fdry. Co., First National Bank Bldg., Pittsburgh, Pa.
West Steel Casting Co., 805 E. 70th St., Cleveland, O.

CASTINGS (Worm & Gear Bronze)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

CEMENT (High Temperature)
Norton Company, Worcester, Mass.
Strong, Carlisle & Hammond Co., The, 1394 W. 3rd St., Cleveland, O.

CHAIN (Sprocket)
Peoria Malleable Castings Co., Peoria, Ill.

CHARGING MACHINES (Cupola)
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.
Morgan Engineering Co., The, Alliance, O.
Shepard Niles Crane & Hoist Corp., 358 Schuyler Ave., Montour Falls, N. Y.

CHARGING MACHINES (Open Hearth)
Morgan Engineering Co., The, Alliance, O.
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CHROME ORE
Samuel Frank & Co., Inc., Harrison Bldg., Philadelphia.

CHROMIUM METAL
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.

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American Chemical Paint Co., Ambler, Pa.

COAL AND COKE
Alan Wood Steel Co., Conshohocken, Pa.
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Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.

COKE—See COAL AND COKE

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Alliance Machine Co., The, Alliance, O.
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland.
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Koppers Construction Co. 1301 Koppers Bldg., Pittsburgh.

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Electric Controller & Mfg. Co., 2098 E. 79th St., Cleveland, O.

COMPRESSORS (Air)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.

CONCRETE REINFORCING BARS —See BARS (Concrete Reinforcing)

CONDENSERS (Surface, Barometric, Multi-Jet)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

CONDUITS (Electric)
Steel & Tubes, Inc., 224 E. 121st St., Cleveland, O.
Youngstown Sheet & Tube Co., Youngstown, O.

CONTRACTORS—See ENGINEERS AND CONTRACTORS

CONTROLLERS (Electric)
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.
General Electric Co., Schenectady, N. Y.

CONVEYER BELTS (High & Low Temperature)
Wickwire Spencer Steel Co., 41 E. 42nd St., New York City.

COTTER PINS
Hindley Mfg. Co., Valley Falls, R. I.

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Alliance Machine Co., The, Alliance, O.
Harnischfeger Corp., 4411 W. National Ave., Milwaukee, Wis.
Morgan Engineering Co., Alliance, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

CRANES (Creeper, Erection)
Harnischfeger Corp., 4411 W. National Ave., Milwaukee, Wis.

CRANES (Electric)
Alliance Machine Co., The, Alliance, O.
Harnischfeger Corp., 4411 W. National Ave., Milwaukee, Wis.
Morgan Engineering Co., Alliance, O.
Shaw-Box Crane & Hoist Co., Inc., 406 Broadway, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp., 358 Schuyler Ave., Montour Falls, N. Y.

CRANES (Gantry)
Alliance Machine Co., The, Alliance, O.
Harnischfeger Corp., 4411 W. National Ave., Milwaukee, Wis.
Morgan Engineering Co., The, Alliance, O.
Shepard Niles Crane & Hoist Corp., 358 Schuyler Ave., Montour Falls, N. Y.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

CRANES (Hand)
Shaw-Box Crane & Hoist Co., Inc., 406 Broadway, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp., 358 Schuyler Ave., Montour Falls, N. Y.

CRANES (Jib)
Alliance Machine Co., The, Alliance, O.
Harnischfeger Corp., 4411 W. National Ave., Milwaukee, Wis.
Morgan Engineering Co., The, Alliance, O.
Shepard Niles Crane & Hoist Corp., 358 Schuyler Ave., Montour Falls, N. Y.

CRANES (Locomotive)
Harnischfeger Corp., 411 W. National Ave., Milwaukee, Wis.

CUTTING AND WELDING—See WELDING

CUTTING OILS
Sun Oil Co., 1608 Walnut St., Philadelphia, Pa.

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National Tube Co., Frick Bldg., Pittsburgh, Pa.
Scaife, Wm. B., & Sons Co., Oakmont, Pa.

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Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.
Vanadium Corp. of America, 120 Broadway, New York City.

DIE BLOCKS
Bethlehem Steel Co., Bethlehem, Pa.

DIE HEADS
Landis Machine Co., Waynesboro, Pa.

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Truscon Steel Co., Pressed Steel Div., Youngstown, O.

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Thomas Spacing Machine Co., Pittsburgh, Pa.

DRILLING MACHINES (Radial)
Thomas Spacing Machine Co., Pittsburgh, Pa.

DRILLS (Twist)—See TWIST DRILLS

DRIVES (Cut Herringbone Gears)
Lewis Foundry & Machine Co., P. O. Box 1591, Pittsburgh, Pa.
Mackintosh-Hemphill Co., Penn Ave. at Water St., Pittsburgh, Pa.
Mesta Machine Co., P. O. Box 1124, Pittsburgh, Pa.
United Engineering & Fdry. Co., First National Bank Bldg., Pittsburgh, Pa.

DRIVES (Multi V-Belt)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

DUST ARRESTER EQUIPMENT
American Foundry Equipment Co., Mishawaka, Ind.

ELECTRICAL EQUIPMENT
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.
General Electric Co., Schenectady, N. Y.

ELECTRIC HEATING ELEMENTS
Driver-Harris Co., Harrison, N. J.

ELECTRIC WELDING—See WELDING

ENGINEERS AND CONTRACTORS
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.
Laughlin, Alex, & Co., First National Bk. Bldg., Pittsburgh, Pa.
Morgan Engineering Co., The, Alliance, O.
Wean Engineering Co., Warren, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

ENGINEERS (Consulting)
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Wean Engineering Co., Warren, O.

ENGINEERS, CONSULTING (By-Product Coke Oven & Gas Plants)
Koppers Construction Co., 1301 Koppers Bldg., Pittsburgh.

FACING MACHINES (Structural)
Thomas Spacing Machine Co., Pittsburgh, Pa.

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Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
International Nickel Co., Inc., 67 Wall St., New York City.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.
Vanadium Corp. of America, 120 Broadway, New York City.

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Morgan Engineering Co., The, Alliance, O.

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Linde Air Products Co., 30 E. 42nd St., New York City.

ACIDS (Pickling)
American Chemical Paint Co., Ambler, Pa.

AIR COMPRESSORS—See COMPRESSORS (Air)

ALLOYS—See FERROALLOYS

ANGLES, CHANNELS—See BEAMS, CHANNELS, ANGLES

ARBORS
Morse Twist Drill & Machine Co., New Bedford, Mass.

AXLES
Bethlehem Steel Co., Bethlehem, Pa.
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Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Tennessee Coal Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.

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Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

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Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Republic Steel Corp. Youngstown, O.
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Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
McClintic-Marshall Corp., Bethlehem, Pa.

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Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Timken Steel & Tube Co., Canton, O.

BARS (Concrete Reinforcing)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 S. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Youngstown Sheet & Tube Co., Youngstown, O.

BARS (Iron)—See IRON (Bar)

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

BEAMS, CHANNELS, ANGLES, ETC.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

BEARINGS (Ball)
Bantam Ball Bearing Co., The, South Bend, Ind.

BEARINGS (Bronze)
Shenango-Penn Mold Co., Dover, O.

BEARINGS (Journal)
Bantam Ball Bearing Co., The, South Bend, Ind.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Roller)
Bantam Ball Bearing Co., The, South Bend, Ind.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Thrust)
Bantam Ball Bearing Co., The, South Bend, Ind.
Timken Roller Bearing Co., The, Canton, O.

BENDING AND STRAIGHTENING MACHINES
Alliance Machine Co., The, Alliance, O.
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Logemann & Bros. Co., 3126 Burleigh St., Milwaukee.
Morgan Engineering Co., The, Alliance, O.
Thomas Spacing Machine Co., Pittsburgh, Pa.

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Construction Co., 1301 Koppers Bldg., Pittsburgh.
Youngstown Sheet & Tube Co., Youngstown, O.

BILLETS (Alloy and Carbon Steel)
Alan Wood Steel Co., Conshohocken, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. La Salle St., Chicago, Ill.
Republic Steel Corp., Youngstown, O.
Timken Steel & Tube Co., Canton, O.
Washburn Wire Co., Phillipsdale, R. I.

BILLETS (Forging)
Alan Wood Steel Co., Conshohocken, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Midvale Co., The, Nicetown Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Timken Steel & Tube Co., Canton, O.

BILLETS AND BLOOMS
Alan Wood Steel Co., Conshohocken, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Timken Steel & Tube Co., Canton, O.
Youngstown Sheet & Tube Co., Youngstown, O.

BLAST FURNACE SPECIALTIES
Bailey, Wm. M., Co., 702 Magee Bldg., Pittsburgh, Pa.

BLAST FURNACES—See FURNACES (Blast)

BLOWERS
General Electric Co., Schenectady, N. Y.
Strong, Carlisle & Hammond Co., The, 1394 W. 3rd St., Cleveland, O.

BOILER HEADS
Bethlehem Steel Co., Bethlehem, Pa.

BOILER TUBES—See TUBES (Boiler)

BOLTS
Bethlehem Steel Co., Bethlehem, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Jones & Laughlin Bldg., Pittsburgh, Pa.
Oliver Iron & Steel Corp., S. 10th & Muriel Sts., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Ryerson, Jos. T., & Son, Inc. 16th and Rockwell Sts. Chicago Ill.

BOLT AND NUT MACHINERY
Landis Machine Co., Waynesboro, Pa.

BOXES (Annealing)
United Engineering & Fdry. Co., First National Bank Bldg., Pittsburgh, Pa.

BOXES (Case Hardening)
Strong, Carlisle & Hammond Co., The, 1394 W. 3rd St., Cleveland, O.

BOXES (Open Hearth Charging)
Morgan Engineering Co., The, Alliance, O.
Wellman Engineering Co. 7000 Central Ave., Cleveland, O.

BRAKES (Electric)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

BRICK (Fire Clay)
Eureka Fire Brick Works, 1015 House Bldg., Pittsburgh, Pa.
Strong, Carlisle & Hammond Co., The, 1394 W. 3rd St., Cleveland, O.

BRICK (Silicon Carbide)
Norton Co., Worcester, Mass.

BRIDGE CRANES (Ore and Coal Handling)
Alliance Machine Co., The, Alliance, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

BRIDGES, BUILDINGS, VIADUCTS, STACKS
American Bridge Co., Frick Bldg., Pittsburgh, Pa.
Belmont Iron Works, 22nd and Washington Ave., Philadelphia, Pa.
International Stacey Corp., Columbus, O.
McClintic-Marshall Corp., Bethlehem, Pa.
Ohio Structural Steel Co., The, Newton Falls, O.
Truscon Steel Co., Youngstown, O.

BUCKETS (Clam Shell, Dragline, Grab, Single Line)
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.
Harnischfeger Corp., 411 W. National Ave., Milwaukee, Wis.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.